Committees: Buildings Chief Officer Group – for Decision. CAS Senior Responsible Officer – for Decision. Resource Allocation Sub (Policy and Resources) Committee – for information. Projects and Procurement Sub Committee – for information.	**Dates:** Jan 2024 Jan 2024 11 March 2024 15 April 2024
Subject: Climate Action Strategy (CAS) – Capital Delivery Programme for Operational Buildings: The Warren Carbon Reduction Measures. **Unique Project Identifier:** 12425	**Gateway 3/4/5: Options Appraisal and Authority to Start Work (Regular)**
Report of: City Surveyor **Report Author:** Adam Fjaerem	**For Information**
PUBLIC	

1. Status update	**Project Description:** This paper is for a single project to deliver three Energy Conservation Measures (ECM) at The Warren, Epping Forest to reduce energy consumption, costs and carbon emissions. **RAG Status:** Green **Risk Status:** Medium **Total Estimated Cost of Project (excluding costed risk): £429,227** **Change in Total Estimated Cost of Project (excluding costed risk): £0** No previous estimated cost. The total estimate cost (including risk) is within the previously allocated combined funding, as set out in the Funding Strategy of the Options Appraisal Matrix (see below). **Spend to Date: £4,349** **Costed Risk Provision Utilised: £0 (of which £0 amount has been drawn down since the last report to Committee);** **Funding Source:** CAS Year 3 Plan budget and CWP. **Slippage:** The Gateway 2 paper set out a completion date of March 2025 and a gateway 2 program completion by September 2023.

2. Next steps and requested decisions	**Next Gateway:** Gateway 6: Outcome Report **Next Steps:** • Establish Project Team, to be managed by City Surveyor's Minor Projects Team. • Instruct works contract for Vital Energi. • Detailed design to be undertaken by Vital Energi and approved by CoL. • Vital Energi to raise supply orders. • Commence installation. **Requested Decisions:** 1. That **Option** 3 is approved for the delivery of a single project to deliver three ECM. These works relate to the same site and their inclusion in a single project will provide a cost-effective approach and ensure good alignment of the works under a single main contractor. 2. Note the total estimated cost of the project at **£429,227** (excluding costed risk); 3. Approve a budget of **£381,535** for the capital works to reach the next Gateway; 4. Approve a budget of **£47,692** for the fees, which include project management support and building control, to reach the next Gateway; 5. Approve a Costed Risk Provision of **£42,923** (to be drawn down via delegation to Chief Officer in consultation with the Chamberlain as a post mitigation cost to solve the highlighted risk. This will be funded from CAS funds if required); 6. Enter into a new works agreement with Vital Energi to undertake the works as Principal Contractor and Principal Designer, in accordance with the terms of their existing contract with CoL to deliver services under the National Framework Agreement for Energy Performance Contracting; 7. Procure the project management support services required to reach the next gateway.
3. Budget	The following sets out the budget for the recommended option 3. Total estimated cost of the project, including risk: **£ £472,150** (including a costed risk budget of **£42,923**). Spend to date of **£4,348.89**. In accordance with the 'Climate Action Strategy (CAS) – Capital Delivery Programme for Operational Buildings' (see background documents) "In the case of centrally funded sites, financial savings that are made will accrue back to the City Corporation as a contribution to the Build Back Better Fund held in City Fund or City Estate as appropriate. Therefore, departmental local risk budgets will be adjusted accordingly."

The funding arrangement is presented in the Options Appraisal Matrix under option 3. The budget requested for option 3 to reach the next gateway is set out below.

Item	Reason	Funds/ Source of Funding	Cost (£)
Works: Insulation to pipework.	Main works	CAS Year 3 Plan budget. (this paper, GW5 approved budget drawdown)	£1,327
Works: LED lighting replacement.	Main works		£47,503
Works: Air Source Heat Pump.	Main works		£332,705
Fees: Consultancy services to support project delivery.	Project delivery resources		£38,154
Fees: Building Control.	Compliance	CAS Year 3 Plan budget (GW2 approved budget drawdown)	£4,769
Fees: Permission and compliance.	Compliance		£4,769
Total			**£429,227**
Funded from CWP			**£214,613[1]**
Funded from CAS GW5 budget (approved by this paper)			**£205,076**
Funded from CAS GW2 project development budget			**£9,538**

Costed Risk Provision requested for this Gateway: £42,923 from the CAS Year 3 Plan budget (as detailed in the Risk Register – Appendix 2) to cover any variations which may be required following detailed design, cost uplift from inflation, additional project management costs and making good.

4. Overview of project options

Option 1 (not recommended). Cancel the project. Do not proceed with the single project covered by this paper to install three ECMs at The Warren. This is not recommended as it will not support the City of London's goals for reducing carbon emissions and energy costs.

Option 2 (not recommended). Proceed with a reduced scope project. Proceed with a single project to install two ECMs at The Warren. This is not recommended as it will only support the City of

[1] Cyclical Works Programme has a project to replace boilers, heating controls, room controls and pumps in the building in 2024/25 and landlords lighting in 26/27. This funding has been transferred to this project to contribute to ECM3 – Air Source Heat Pump and ECM2 - LED lighting.

	London's goals for reducing carbon emissions and energy costs in a limited way whilst leaving an aged boiler plant to be replaced as a separate project. **Option 3 (recommended): Proceed with the project to install the ECM measures.** The scope of this project is to install three distinct ECM.
5. Recommended option	Option 3, to proceed with this project to install three ECM. Combining these three ECM into one project at the same site will provide a more cost-effective approach and ensure good alignment of the works under a single main contractor. These measures will provide energy cost and carbon emission savings and can be met within the existing provisionally approved funding. This option provides an estimated saving of c.£6,416 per annum in electricity and gas costs which will support the City Corporations Build Back Better Fund. The simple payback for this project for the CAS funding element is 40.1 years (including costed risk). The option provides an estimated annual saving of 18.7 tCO_2e (based on projected 2027 electricity carbon factors), equating to an 53% reduction in the sites carbon emissions, which will support the City Corporation to meet its net zero carbon by 2027 target as set out in the CAS. The boiler plant at this site is older than CIBSE recommended life expectancy of such plant and as such is likely to fail and require replacing as an emergency. The Air Source Heat Pump (ASHP) recommended in this project will allow for a planned replacement with a low carbon alternative.
6. Risk	**Service interruption**. The project to install these three ECM will be completed whilst the building is operational. The heating will need to be turned off for the final connection of the ASHP to the existing heating system and this will be programmed to avoid impacting the building users. **Health and safety**: all works within the demise will require careful management in line with City of London policies. Further information available in the Risk Register (Appendix 2) and options appraisal matrix. **Costed Risk Provision requested for this Gateway: £42,923** (as detailed in the Risk Register – Appendix 2) to cover any variations which may be required following detailed design, additional project management costs and making good.

7. Procurement approach	City of London have an existing Call-off-Contract with Vital Energi under GLA's Re:fit framework, for which Vital Energi (the Service Provider) will provide a range of services including High Level Assessments, Investment Grade Proposals and Works Contracts to carry out Energy Efficiency Measures under an Energy Performance Guarantee. Vital Energy have completed surveys of The Warren and issued CoL with an Investment Grade Proposal (IGP) in accordance with their contract. The IGP sets out the firm costs, guaranteed savings and Measurement and Verification (M&V) plan for the works. The single project comprising of three separate ECM set out in this paper are to be carried out through entering into a new works agreement with Vital Energi, under the Call-off-Contract. Vital Energi will undertake the design and construction of the works and undertake the duties of Principal Contractor and Principal Designer. Following project completion, Vital Energi will undertake a M&V exercise, in accordance with an agreed method and best practice industry standards, to evidence the achieved savings.
8. Design summary	The final design shall be undertaken by Vital Energi as part of their works agreement and issued to CoL for approval. The following summarises the design as set out in Vital Energi's Investment Grade Proposal (IGP) which has been informed through on-site surveys with their design team and sub-contractors. <u>Pipework insulation</u> This ECM involves the installation of insulation onto exposed valves, flanges, pipework and heat exchangers. The need for this insulation has been identified via site surveys with temperatures loses noted through using thermal imaging cameras. Where existing insulation is missing or damaged this will be replaced with new insulation with the old material disposed of suitably. <u>LED Lighting replacement</u> The site has already replaced a number of older, less energy efficient fluorescent luminaires with new LED versions. However, there are still some fluorescent luminaires remaining and this ECM will replace these so that the entire site is lit by LED. These will be replaced as a point for point replacement using the existing wiring and switching arrangements. If further energy saving opportunity are available through installing occupancy controls in certain areas then this will be done as part of the installation. <u>ASHP installation</u>

	This ECM involves the removal of the existing boilers, calorifier and primary pumps and replacing them with a single 110.4kW Air Source Heat Pump (ASHP), a 200 litre indirect domestic hot water calorifier, a 2,000 litre thermal store/buffer vessel and a new primary heating pump. In addition, modifications will be made to the existing heating, electrical, BMS, and DHW systems to optimisation the operation of the new ASHP. The ASHP will be located on the ground floor to the rear of the auxiliary barn, adjacent to the existing heating plantroom. Insulated pipework will be routed above ground to connect the new plant with the existing plantroom and onto the existing heat transference system and emitters. It has been calculated that although the flow and return temperatures from the ASHP will be lower than those with the existing gas boiler the radiators in the building are already oversized and as such will provide sufficient heat into the building. A contingency fund is available to replace some of the smaller radiators if this is deemed necessary.
9. Delivery team	The project will be led by the Minor Works Projects Team, City Surveyor's. The project management consultancy support set out in this paper will be resourced separately by the Minor Works Team.
10. Success criteria	1. Completed by August 2024. 2. Completed within budget. 3. Verified energy cost savings of £6,416 per annum. 4. Verified carbon savings of 18.7 tCO_2e per annum based on projected 2027 carbon costs.
11. Progress reporting	Project Vision progress reports with any required decisions coming back as an Issue Report.

Appendices

Appendix 1	Project Coversheet
Appendix 2	Risk Register

Background documents

Background Paper. GW2 CAS Capital Delivery Programme

Contact

Report Author	Adam Fjaerem
Email Address	Adam.Fjaerem@cityoflondon.gov.uk
Telephone Number	07871 107 902

Options Appraisal Matrix – in scope Phase 2 Building, out of scope Phase 1 & 3 buildings

Option Summary	Option 1	Option 2	Option 3
1. Brief description of option	**Cancel the project.** Do not proceed with the project to deliver three Energy Conservations Measures (ECM) at the building.	**Proceed with the project.** To deliver two Energy Conservation Measures (ECM).	**Proceed with the project.** To deliver three Energy Conservation Measures (ECM).
2. Scope and exclusions	N/A	Scope: • Pipework insulation • LED lighting replacement	Scope: • Pipework insulation • LED lighting replacement • ASHP installation
Project Planning			
3. Programme and key dates	N/A	• Feb 24: GW3-5 approval, • Mar 24: Instruct works agreement with Vital Energi, • April 24: Contractor mobilisation, supply orders raised, • April 24: Commence installation, • May 24: Complete installation, • May 25: Gateway 6.	• Feb 24: GW3-5 approval, • Mar 24: Instruct works agreement with Vital Energi, • April 24: Contractor mobilisation, supply orders raised, • May 24: Commence installation, • August 24: Complete installation, • August 25: Gateway 6.

Option Summary	Option 1	Option 2	Option 3
4. Risk implications	Low	Low Further information available within the Risk Register (Appendix 2). Service interruption. The insulation to the pipework project can be completed whilst the heating system is operating however, it would be preferable to do this after a period of non-operation to avoid operative's discomfort. This will be coordinated with the Building Manager to avoid any negative impact on the building comfort. LED installation will take place during the day when the building is occupied. The areas to be covered will be planned at the end of the week for the week ahead to allow people who work in those areas to work elsewhere on the day of the install. Most luminaires will be a straight switch and so relatively quick. Any drilling or noisy works will be completed out of normal office hours.	Medium Further information available within the Risk Register (Appendix 2). Service interruption. The insulation to the pipework project can be completed whilst the heating system is operating however, it would be preferable to do this after a period of non-operation to avoid operative's discomfort. This will be coordinated with the Building Manager to avoid any negative impact on the building comfort. LED installation will take place during the day when the building is occupied. The areas to be covered will be planned at the end of the week for the week ahead to allow people who work in those areas to work elsewhere on the day of the install. Most luminaires will be a straight switch and so relatively quick. Any drilling or noisy works will be completed out of normal office hours.

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		Health and safety: No hot works will be required with operatives using cold cutting equipment, all electrical and related works will require careful management in line with City of London policies.	The installation of the ASHP will require the heating system to be turned off during the transfer from the boiler to the ASHP heat source. The ASHP plant would need to be installed first to allow this transfer before the redundant boiler equipment is removed and the gas supply capped off. This transfer will be coordinated with the Building Manager to avoid any negative impact on the building comfort. Health and safety: No hot works will be required with operatives using cold cutting equipment, all electrical and related works will require careful management in line with City of London policies.
5. Stakeholders and consultees	N/A	**Corporate property:** Peter Collinson, Paul Friend, Peter Young, Robert Murphy, Matt Baker, Jonathan Cooper, Darren Horrigan, Grayham Howarth, Ian Hughes, Peter Ochser, Andrew Coke, Neil Hawkins, Stuart Wright, Michaela Dhas, Graeme Low, Mark Donaldson, Edmund Tran, **Chamberlains:** Simon Owen, Andrew Little, Sarah Baker	

Option Summary	Option 1	Option 2	Option 3
		Procurement: Jemma Borland **Site users:** Jacqueline Egglestone, William LoSasso, Emily Brennan, Lee Powell, Nick Clayden, Jennifer Harris	
6. Benefits of option	No funding required.	Cost savings est. of c.£4,151/yr. These savings are guaranteed under the energy performance contract with Vital Energi. A Measurement and Verification (M&V) exercise will be undertaken six months after installation to verify the actual projects savings and this will be evidenced using metered electricity and gas consumption. Carbon emission savings of 2.8 tCO_2e/yr. Improvements in the lighting of areas that have previously not been upgraded to LED. Reduced heat loss into the plant areas through the installation of pipe insulation.	Cost savings est. of c.£6,416/yr. These savings are guaranteed under the energy performance contract with Vital Energi. A Measurement and Verification (M&V) exercise will be undertaken six months after installation to verify the actual projects savings and this will be evidenced using metered electricity and gas consumption. Carbon emission savings of 18.7 tCO_2e/yr. The new ASHP will come with a lower maintenance requirement than with the current aged boiler plant. Improvements in the lighting of areas that have previously not been upgraded to LED.

Option Summary	Option 1	Option 2	Option 3
			Reduced heat loss into the plant areas through the installation of pipe insulation.
7. Disbenefits of option	Higher ongoing energy and maintenance costs	Capital cost. Staff management and resource implications.	Capital cost. Staff management and resource implications.
Resource Implications			
8. Total estimated cost	N/A	Total estimated cost (excluding risk): **£54.933** Highly confident in the cost at this stage. Total estimated cost: (including risk): **£60.427**	Total estimated cost (excluding costed risk): **£429,227** Moderately confident in the cost at this stage. Total estimated cost: (including costed risk): **£472,150**
9. Funding strategy	N/A	The total estimated cost (including risk) of **£60,427** shall be met entirely **from City Estate**. This funding was previously provisionally approved by CAS as set out in the Gateway 2 issue report approved in December 2022.	The total estimated cost (including risk) of **£472,150** shall be met through the following funding sources: **£214,613 from CWP** **£257,537 from City Estate**. This funding was previously provisionally approved by CAS as set out in the Gateway 2 issue

Option Summary	Option 1	Option 2	Option 3
			report approved in December 2022.
10. Investment appraisal	N/A.	A simple payback for the whole project has been estimated of 14.5 years based on estimated cost savings of c£4,151/yr. (based on current energy prices). The energy savings are an estimate based on assumptions of the existing system and proposed system. These estimations will be verified post-completion.	A simple payback for the whole project has been estimated of 55.4 years based on estimated cost savings of c.£6,416/yr. (based on current energy prices). The energy savings are an estimate based on assumptions of the existing system and proposed system. These estimations will be verified post-completion. The boiler plant at this site is older than CIBSE recommended life expectancy of such plant and as such is likely to fail and require replacing as an emergency. The ASHP recommended in this project will allow for a planned replacement with a low carbon alternative.
11. Estimated capital value/return	N/A	Estimated cost savings of c.£4,151/yr and simple payback of 14.5 years.	Estimated cost savings of c.£6,416/yr and simple payback of 40.1 years.

Option Summary	Option 1	Option 2	Option 3
		Confident.	Moderately confident (+/-15%). The savings estimate will be refined as the project is developed to final design and verified after completion.
12. Ongoing revenue implications	N/A	There will be a reduction in the maintenance costs associated with replacing lamps.	There will be a reduction in maintenance costs associated with the heating system as the ASHP will replace the aged boiler system. There will be a reduction in the maintenance costs associated with replacing lamps.
13. Affordability	N/A	The cost for this option can be accommodated within funding allocations already approved in principle, as set out in item 9 above.	The cost for this option can be accommodated within funding allocations already approved in principle, as set out in item 9 above.
14. Legal implications	N/A	None	None.
15. Corporate property implications	Does not align with the Corporate Property Asset Management Strategy 2020-2025	• This project aligns, albeit at a reduced level, with the Corporate Property Asset Management Strategy 2020-	• This project aligns with the Corporate Property Asset Management Strategy 2020-

Option Summary	Option 1	Option 2	Option 3
		2025 in reducing energy costs and carbon emissions.	2025 in reducing energy costs and carbon emissions. • Works require careful planning, consultation and coordination to minimise the disruption and impacts to building services and site users. • This project works require coordination with other site works/projects and activities/events. • Security considerations for contractor access to certain areas. • Maintenance contracts and registers need to be updated to account for the changes to the building services and systems. • Good commissioning and hand-over process required to ensure the upgraded plant and equipment is working satisfactorily.
16. Traffic implications	N/A	None	None.
17. Sustainability and energy implications	Cancelling the project would be a missed opportunity for reducing	The reduced scope of this project would represent a missed	This project supports the City of London's net zero carbon targets

Option Summary	Option 1	Option 2	Option 3
	energy and carbon emissions for this building and does not support the City of London's net zero carbon targets.	opportunity for reducing energy and carbon emissions at this building (whilst being aware that the heating system requires replacement) and does not support the City of London's net zero carbon targets in full.	as set out in the Climate Action Strategy.
18. IT implications	N/A	None	None
19. Equality Impact Assessment	N/A	None	None.
20. Data Protection Impact Assessment	N/A	N/A	N/A
21. Recommendation	Not recommended	Not recommended	**Recommended**