

<b>Committees:</b>	<b>Dates:</b>	
Barbican Estate Residents Consultation Committee (For Information Only)	30 January 2017	
Barbican Residential Committee	13 February 2017	
Projects Sub Committee	17 February 2017	
Community and Children's Services Committee	17 February 2017	
<b>Subject:</b> Concrete testing and repairs – Barbican Estate, Golden Lane Estate and Middlesex Street Estate	<b>Gateway 4 Detailed Options Appraisal (Complex)</b>	<b>Public</b>
<b>Report of:</b> Director of Community & Children's Services <b>Report author:</b> David Downing	<b>For Decision</b>	

### Summary

Project status	Green
Timeline	Gateway 4 – February 2017 Procurement – to June 2017 Gateway 5/authority to commence works – August 2017 Works start – August/September 2017
Programme status	Pending approval of Gateway 4 – Detailed Options Appraisal
Latest estimated total costs (inc. testing, repairs and fees)	Barbican Estate: £905,000 Golden Lane Estate: £1,165,000 Middlesex Street Estate: £205,000 Total: £2,275,000
Expenditure to date (testing and fees)	Barbican Estate: £294,480.60 Golden Lane Estate: £292,375.25 Middlesex Street Estate: £33,400.00 Total: £620,255.85

### Progress to Date

A comprehensive concrete testing programme has been successfully completed. The results of this testing contract have been analysed by an independent concrete specialist who has advised on the extent and recommended method for the emergent repairs to the concrete structures of the Barbican, Golden Lane and Middlesex Street estates.

## Recommendations

The **Barbican Estate Residents Consultation Committee** is asked to note this report for information only.

The **Barbican Residential Committee**, the **Projects Sub Committee** and the **Community and Children's Services Committee** are asked to note and approve the following:

1. That Option 1 is approved for proceeding to Procurement and Gateway 5.
2. That the estimated total project budget of £2,275,000 is noted; of which £905,000 is designated for the Barbican Estate and £1,370,000 is designated for the Golden Lane and Middlesex Street estates.
3. That a budget of £18,400 is approved to reach the next Gateway.
4. That the project is transferred from the complex approval track to the regular approval track.

## Resources Expended to Date

1. Barbican Estate:

At Gateway 1/2, the notified likely cost range was £300,000–£600,000. In advance of the testing programme, an Issues Report was approved by Committee (Barbican Residential Committee 14/12/2015 and Projects Sub Committee 26/01/2016 respectively) to make the full sum of this estimate (£600,000) available to mitigate the risk of the testing revealing emergency repairs which would be required to be addressed for health and safety reasons without delay. Of the sum approved, £285,480.60 was spent on the testing contract; the remainder, a sum of £314,519.40, remains unspent as no requirement to complete emergency repairs arose during the testing contract. In addition, £9,000 of professional fees have been spent to obtain the advice of a concrete corrosion specialist, Dr John Broomfield, and also the services of a principal designer (under CDM Regulations 2015) for the duration of the testing contract.

<b>Barbican Estate</b>	
Previous estimated total cost	£600,000.00
Approved budget to G4	£600,000.00
Testing costs	£285,480.60
Emergency repair costs	£0.00
Fees and staff costs	£9,000.00
<b>Total expenditure</b>	<b>£294,480.60</b>

Concrete repairs to the Barbican Estate were formally amalgamated with those at the Golden Lane and Middlesex Street estates at Gateway 1/2 to realise cost-efficiencies.

2. Golden Lane Estate:

Of the £750,000 sum approved at Gateway 3 to cover testing and immediate repairs at Golden Lane Estate, a total of £284,220.25 was expended only as there was no requirement to complete emergency repairs. In addition, £8,155 of professional fees have been spent to obtain the advice of a concrete corrosion specialist, Dr John

Broomfield, and also the services of a principal designer (under CDM Regulations 2015) for the duration of the testing contract.

<b>Golden Lane Estate</b>	
Previous estimated total cost	£1,335,000.00
Approved budget to G4	£750,000.00
Testing costs	£284,220.25
Emergency repair costs	£0.00
Fees and staff costs	£8,155.00
<b>Total expenditure</b>	<b>£292,375.25</b>

### 3. Middlesex Street Estate:

Of the £250,000 sum approved at Gateway 3 to cover testing and immediate repairs at Middlesex Street Estate, a total of £31,000 was expended only as there was no requirement to complete emergency repairs. In addition, £2,400 of professional fees have been spent to obtain the advice of a concrete corrosion specialist, Dr John Broomfield, and also the services of a principal designer (under CDM Regulations 2015) for the duration of the testing contract.

<b>Middlesex Street Estate</b>	
Previous estimated total cost	£562,000.00
Approved budget to G4	£250,000.00
Testing costs	£31,000.00
Emergency repair costs	£0.00
Fees and staff costs	£2,400.00
<b>Total expenditure</b>	<b>£33,400.00</b>

## Outcome of Testing Programme

### 1. Barbican Estate:

In general, the residential blocks were found to be in good condition for their age with no systemic risk of chloride or carbonation induced corrosion. The limited repairs identified via the testing are deemed to be consistent with the age and exposure of the building. Indeed, the consultant advises that once the specified patch repairs have been completed the structure of the residential blocks should remain relatively defect free in the foreseeable future, with a repeat of the general condition survey in the main recommended for 20 years' time, with a few isolated areas recommended for repeat survey after a period of 10 years. The estimated cost for repairs to the residential blocks included in this project (excluding fees and staff costs) is £300,000.

The programme of repairs will exclude window boxes which are, in certain locations, showing signs of chloride and sulphate build-up. A more detailed investigation of the window boxes and the possibility of installing waterproofing to the inside and an anti-carbonation coating to the outside faces will be considered for a future project. As pre-cast units there would be potential to achieve cost-efficiencies by purchasing replacement units in bulk once a sufficient quantity required replacement. It would not be cost-efficient to include a limited replacement programme within the patch repairs contract.

The testing to the Barbican Estate car parks reveals more extensive repairs required than to the residential blocks and these are estimated to require up to 40% of the total repair costs for the Estate. The reports, while stating that there is no threat of significant general deterioration due to reinforcement corrosion in the next 50 years or more, do highlight significant corrosion-induced damage in certain areas where there is water leakage and chloride ingress. Once the specified patch repairs and remedial measures have been completed, subject to compliance with Listed Buildings constraints, the consultant recommends repeating the survey exercise in 5–10 years. The estimated cost for repairs to the car parks (excluding fees and staff costs) is £220,000.

## 2. Golden Lane Estate:

For the Golden Lane residential blocks, the analysis of the results shows a very low level of intrusion of chlorides, low carbonation depths and acceptable cover depths to the areas tested. The consultant advises that there is no threat of significant general deterioration due to reinforcement corrosion in the next 50 years or more due to carbonation or chlorides in the areas where survey data was collected. However, corrosion-induced damage was found in certain areas where there was low cover, water leakage and either chloride ingress or carbonation due to wetting and drying. A programme of patch repairs is recommended to address the large number of minor defects to the concrete across the estate, alongside remedial measures to address far more localised issues of chloride ingress to concrete steps and stairways.

The testing to Golden Lane Estate car park revealed significant corrosion-induced damage in certain localised areas subject to water leakage and chloride ingress. A programme of patch repairs and application of protective coatings, subject to compliance with Listed Building constraints, has been recommended. A repeat survey, 5–10 years after repairs are completed, is also recommended.

In addition to these concrete repairs, tiling to the two gable ends of Stanley Cohen House requires replacement due to a failure of the render attaching these tiles to the concrete walls. The full extent of the tiling to these gable ends has already been removed to mitigate the risk to the public from falling debris; testing having revealed substantial hollow areas behind debonded tiles. As a Grade II Listed Building, approval of a like-for-like replacement tile will be sought from City of London Planning. It is intended, to realise cost-efficiencies, to include this retiling work within the concrete repairs contract.

## 3. Middlesex Street Estate:

The testing results for Petticoat Square found a very low intrusion of chlorides and carbonation and reasonably high cover depths for the walkway parapet walls. However, it did reveal a significant risk of chloride-induced corrosion on the stairs and of carbonation-induced corrosion on the stairs, beams and soffits. In addition, testing to the car park revealed extensive cracking and spalling that will need to be addressed before deteriorating further. A programme of remedial works has been specified with a recommendation to re-survey in either 10 years or towards the end of any warranty period secured from the repairs contractor.

The concrete structure of Petticoat Tower was found to be in excellent condition; no further concrete repairs to Petticoat Tower are required at this time. Furthermore, there

was no requirement determined for another survey of the concrete condition for the next 50 years unless new damage or new causes of damage are identified.

## Overview of Options

As approved at Gateway 3, there is only one practicable option for this project: establishing a planned programme of repairs at a competitively tendered rate based on the testing results. There is no option to do nothing owing to the risks, both physical and reputational, that are posed by allowing the continued deterioration of the estates. The Options Matrix below therefore presents only one option.

## Proposed Way Forward

The proposed way forward is to proceed with the option outlined above. It is also proposed that, due to the lessening of the major risks inherent in the project, namely the significant reduction in risk of a major concrete failure due to the comprehensive testing programme just completed, and a greater confidence in the cost estimates prepared from the results of the testing contract, the project be moved from the Complex approval track onto the Regular track as befits the current risk and cost assessments.

## Financial Implications

### 1. Barbican Estate:

<b>Barbican Estate – previous estimate</b>	<b>Total estimated project cost – at previous Gateway</b>
Concrete testing and repair	£600,000
Fees and staff costs	No provision made at previous Gateway
<b>Total</b>	<b>£600,000</b>

<b>Barbican Estate – current estimate</b>	<b>Total estimated project cost – at Gateway 4</b>
Testing costs (rounded)	£285,000
Repairs to residential blocks	£300,000
Repairs to car parks	£220,000
Fees and staff costs	£100,000
<b>Total</b>	<b>£905,000</b>
<b>Funding strategy</b>	
Source	City Fund (works to residential blocks circa 95% recoverable from leaseholders, works to car parks from the Car Park Account)

### 2. Golden Lane Estate:

<b>Golden Lane Estate – previous estimate</b>	<b>Total estimated project cost – at previous Gateway</b>
Concrete testing and repair	£1,800,000
Fees and staff costs	£225,000
<b>Total</b>	<b>£2,025,000</b>

Of the estimated budget notified at Gateway 3, a sum of £600,000 (works) plus £90,000 (fees and staff costs) has been transferred from this project to the stand-alone Cullum Welch Concrete Repair project as approved by Issues Report (Projects Sub Committee, 07 September 2016).

Previous estimates are thus revised as:

<b>Golden Lane Estate – previous estimate</b>	<b>Total estimated project cost – following Issues Report</b>
Concrete testing and repair	£1,200,000
Fees and staff costs	£135,000
<b>Total</b>	<b>£1,335,000</b>

<b>Golden Lane Estate – current estimate</b>	<b>Total estimated project cost – at Gateway 4</b>
Testing costs (rounded)	£285,000
Repairs costs	£750,000
Fees and staff costs	£130,000
<b>Total</b>	<b>£1,165,000</b>
<b>Funding strategy</b>	
Source	HRA (circa 36% of works to residential blocks recoverable from leaseholders)

3. Middlesex Street Estate:

<b>Middlesex Street Estate – previous estimate</b>	<b>Total estimated project cost – at previous Gateway</b>
Concrete testing and repair	£500,000
Fees and staff costs	£62,500
<b>Total</b>	<b>£562,000</b>

<b>Middlesex Street Estate – current estimate</b>	<b>Total estimated project cost – at Gateway 4</b>
Testing costs	£31,000
Repairs costs	£150,000
Fees and staff costs	£24,000
<b>Total</b>	<b>£205,000</b>
<b>Funding strategy</b>	
Source	HRA (circa 29% of works to residential blocks recoverable from leaseholders)

Committees are invited to note that across the three estates combined there is an overall reduction in total estimated project cost of £222,500.

## Options Appraisal Matrix

See attached.

## Appendices

<b>Appendix 1</b>	PT 4 Procurement form
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## Contact

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## Options Appraisal Matrix

	<b><i>Option 1</i></b>
<b>1. Brief description</b>	A planned programme of concrete repairs, based on the outcomes of the recently completed testing contracts to the Barbican, Golden Lane and Middlesex Street Estates.
<b>2. Scope and exclusions</b>	<p>Scope: Residential blocks and car parks at the Barbican Estate, Golden Lane Estate and Middlesex Street Estate.</p> <p>Exclusions: Window boxes &amp; defects to podiums and walkways at the Barbican Estate. The freehold section of Wallside, Barbican Estate. Mountjoy House, Breton House and sections of the three Barbican Towers where concrete repair works were completed recently. Cullum Welch House and Great Arthur House at the Golden Lane Estate.</p>
<b><i>Project Planning</i></b>	
<b>3. Programme and key dates</b>	<p>Gateway 4 / Detailed Options Appraisal – February 2017</p> <p>Procurement – to June 2017</p> <p>Gateway 5 / Authority to Commence Works – August 2017</p> <p>Works Start – August/September 2017</p>
<b>4. Risk implications</b>	<p>The project is currently low risk.</p> <p>Patches of deteriorated concrete have been identified, removed and made safe as part of the now completed testing contract. The risk remains that further patches continue to deteriorate if there is any undue delay to the project.</p> <p>Following the testing process, the extent of repairs is well known and the associated costs can be predicted with a higher degree of accuracy.</p>

	<b><i>Option 1</i></b>
	Involvement of the Planning Department and potentially English Heritage for approval of the completed works at the Golden Lane Estate and Barbican Estates could impact upon time and cost aspects of the project. An approved method statement for concrete repair at the Barbican Estate however is already held by the CoL Planning team.
<b>5. Benefits and disbenefits</b>	<p>Benefits</p> <ul style="list-style-type: none"> <li>• The safety of the buildings will be confirmed and any further deterioration will be prevented.</li> <li>• The intervention now will prevent more major repairs in future.</li> </ul>
<b>6. Stakeholders and consultees</b>	<ul style="list-style-type: none"> <li>• Residents, including leaseholders through Section 20 consultation where they stand to incur service charges.</li> <li>• Departments of City Surveyor's, Town Clerks, Planning and Chamberlain's (including CityProc).</li> <li>• Members and Ward Members.</li> <li>• Barbican Centre (with regard to the lower floors of Frobisher Crescent).</li> </ul>
<b><i>Resource Implications</i></b>	
<b>7. Total Estimated cost</b>	<p>£2,275,000</p> <p>The project costs included in this report are shown at current prices (12/2016 price base). As a consequence no uplift has been included for inflation.</p>
<b>8. Funding strategy</b>	<p>Barbican Estate: The project is funded by the City Fund; works to residential blocks are 95% recoverable from leaseholders via the service charge. Works to the lower floors of Frobisher Crescent to be recovered from the Barbican Centre. Works to Barbican Car parks via the Barbican Car Park account.</p>

	<b><i>Option 1</i></b>
	Golden Lane/Middlesex Street Estate: Housing Revenue Account (HRA). Service Charge Recovery from leaseholders for works to residential blocks; circa 36% for Golden Lane blocks & 29% for Petticoat Square, Middlesex Street.
<b>9. Estimated capital value/return</b>	N/A
<b>10. Ongoing revenue implications</b>	Once works are complete, a potential ongoing revenue implication is the recommendation for cyclical concrete monitoring or testing on a regular basis in the future – specific recommendations will follow project completion, dependent upon the condition of the concrete as identified through this project and the nature of the repairs carried out.
<b>11. Investment appraisal</b>	N/A
<b>12. Affordability</b>	The works have been factored into the Asset Management plans for the Barbican and HRA Estates.
<b>13. Procurement Strategy</b>	Due to the differing technical aspects of the repairs, it is recommended that the works be split into lots for tendering purposes, with separate lots for the Barbican Estate and a combined lot for the Golden Lane and Middlesex Street Estates. In the event of a single contractor winning both lots, the City would require a discount to be offered on the works to ensure cost efficiencies were maximised. It is recommended that these works are advertised on the City of London's Capital eSourcing portal. An assessment of quality will form an essential part of the tender process; this is particularly important at the Barbican and Golden Lane Estates where the appearance of the completed works will require planning approval and potentially Listed Building Consent in accordance with the Listed Building Management Guidelines and English Heritage guidance. Splitting into lots would also open the bidding to smaller, more specialist, contractors whereby the required level of quality control can be more effectively managed as opposed to a sub-contractor appointed by a larger concern. The process would

	<b><i>Option 1</i></b>
	be managed by City Procurement.
<b>14. Legal implications</b>	Maintaining the assets in a compliant way discharges the City's legal and statutory obligations.
<b>15. Corporate property implications</b>	It is essential that the City's assets remain in good, safe and statutory compliant condition. Therefore all necessary action should be taken to ensure that assets are kept as such throughout their lifetime.
<b>16. Traffic implications</b>	This would be discussed and agreed with appointed contractors where the works have any impact on roads/highways. Access may be required to areas outside of the housing estates during the project. The logistics will be negotiated with the contractor and the Department of the Built Environment as necessary.
<b>17. Sustainability and energy implications</b>	N/A
<b>18. IS implications</b>	N/A
<b>19. Equality Impact Assessment</b>	This project is not anticipated to impact on equality assessment criteria.
<b>20. Recommendation</b>	Recommended
<b>21. Next Gateway</b>	Gateway 5 - Authority to Start Work

		<i>Option 1</i>		
<b>22. Resource requirements to reach next Gateway</b>	<b>Item</b>	<b>Reason</b>	<b>Cost (£)</b>	<b>Funding Source</b>
	Concrete Corrosion Consultant	Draft formal specification for tender; advise on tender returns	£6,000	HRA (66%), City Fund (33%)
	Quantity Surveyor	Verify cost data & advise on tender returns	£10,000	HRA (66%), City Fund (33%)
	Staff Costs	Staff time – specification and tender	£2,400	HRA (66%), City Fund (33%)