Public Document Pack



Operational Property and Projects Sub Committee

Date: MONDAY, 3 JULY 2023

Time: 1.45 pm

Venue: COMMITTEE ROOMS, WEST WING, GUILDHALL

Members: Alderman Timothy Hailes (Chair) Deputy Shravan Joshi (Deputy Chairman) Deputy Randall Anderson Deputy Keith Bottomley Deputy Henry Colthurst Deputy Madush Gupta Caroline Haines Deputy Christopher Hayward Deputy Edward Lord Paul Martinelli Anett Rideg Tom Sleigh Luis Felipe Tilleria Deputy Philip Woodhouse

Enquiries: Matthew Stickley, Governance and Member Services Manager Matthew.Stickley@cityoflondon.gov.uk

Accessing the virtual public meeting

Members of the public can observe all virtual public meetings of the City of London Corporation by following the below link: https://www.youtube.com/@CityofLondonCorporation/streams

A recording of the public meeting will be available via the above link following the end of the public meeting for up to one civic year. Please note: Online meeting recordings do not constitute the formal minutes of the meeting; minutes are written and are available on the City of London Corporation's website. Recordings may be edited, at the discretion of the proper officer, to remove any inappropriate material.

Whilst we endeavour to livestream all of our public meetings, this is not always possible due to technical difficulties. In these instances, if possible, a recording will be uploaded following the end of the meeting.

Ian Thomas CBE Town Clerk and Chief Executive

AGENDA

1. APOLOGIES

2. MEMBERS' DECLARATIONS UNDER THE CODE OF CONDUCT IN RESPECT OF ITEMS ON THE AGENDA

3. MINUTES

To agree the public minutes and non-public summary of the meeting held on 5 June 2023.

For Decision (Pages 7 - 12)

4. GW5: BEECH STREET TRANSPORTATION AND PUBLIC REALM

Report of the Executive Director Environment.

For Decision (Pages 13 - 136)

5. GW5: MOOR LANE ENVIRONMENTAL ENHANCEMENTS

Report of the Executive Director Environment.

For Decision (Pages 137 - 232)

6. GW6: ALDGATE HIGHWAY CHANGES AND PUBLIC REALM IMPROVEMENTS

Report of the Executive Director Environment.

For Decision (Pages 233 - 264)

7. CITY ASSESSMENT CENTRE STAGE 2 PROCUREMENT

Report of the Executive Director of Community and Children's Services.

For Decision (Pages 265 - 270)

8. INCREASE IN CONTRACT VALUE - WORK AND HEALTH PROGRAMME -CENTRAL LONDON WORKS

Report of the Director of Economic Development, Innovation and Growth.

For Decision

(Pages 271 - 274)

9. PROCUREMENT CODE ADJUSTMENTS: BRIDGE HOUSE ESTATES

Report of the Chief Operating Officer.

For Decision (Pages 275 - 300)

10. ADOPTION OF CONSIDERATE LIGHTING CHARTER

Report of the City Surveyor.

For Decision (Pages 301 - 306)

11. ADOPTION OF DESIGN STANDARD

Report of the City Surveyor.

For Decision (Pages 307 - 508)

12. CYCLICAL WORKS PROGRAMME 2022/23 OUTTURN

Report of the City Surveyor.

For Information (Pages 509 - 514)

13. 2022/23 Q4 OPERATIONAL PROPERTY ENERGY AND CARBON PERFORMANCE UPDATE

Report of the City Surveyor.

For Information (Pages 515 - 524)

14. THE CITY SURVEYOR'S 2022-27 BUSINESS PLAN - 2022/23 Q4 UPDATE Report of the City Surveyor.

For Information

(Pages 525 - 536)

15. THE CITY SURVEYOR'S CORPORATE AND DEPARTMENTAL RISK REGISTER -JUNE 2023 UPDATE

Report of the City Surveyor.

For Information (Pages 537 - 558)

16. CLIMATE ACTION STRATEGY UPDATE

Report of the City Surveyor.

For Information (Pages 559 - 568)

17. **PROJECT GOVERNANCE REVIEW UPDATE**

Report of the Chief Operating Officer.

For Information (Pages 569 - 698)

18. QUESTIONS ON MATTERS RELATING TO THE WORK OF THE SUB COMMITTEE

19. ANY OTHER BUSINESS THE CHAIR CONSIDERS URGENT

20. EXCLUSION OF THE PUBLIC

MOTION - That under Section 100(A) of the Local Government Act 1972, the public be excluded from the meeting for the following item(s) on the grounds that they involve the likely disclosure of exempt information as defined in Part I of Schedule 12A of the Local Government Act.

For Decision

21. NON-PUBLIC MINUTES

To agree the non-public minutes of the meeting held on 5 June 2023.

For Decision (Pages 699 - 702)

22. APPENDIX: CITY ASSESSMENT CENTRE STAGE 2 PROCUREMENT

For Decision (Pages 703 - 706)

23. GW2: GUILDHALL SCHOOL OF MUSIC AND DRAMA AND BARBICAN CENTRE ROOF

Report of the Barbican Centre and Guildhall School of Music and Drama.

For Decision

(Pages 707 - 742)

24. GW6: REQUEST FOR DELEGATED AUTHORITY: CITY'S ESTATE: REFURBISHMENT/EXTENSION OF THE COURTYARD - 1 ALFRED PLACE W1

Report of the City Surveyor.

For Decision (Pages 743 - 744)

25. ST LAWRENCE JEWRY CHURCH

Report of the City Surveyor.

For Decision (Pages 745 - 766)

26. CATERING CONTRACT EXTENSION FOR CITY OF LONDON SCHOOL AND THE CITY OF LONDON SCHOOL FOR GIRLS

Report of the Headmistress, City of London Girls School, and Head, City of London School.

For Decision

(Pages 767 - 786)

27. CATERING CONTRACT EXTENSION FOR MANSION HOUSE AND THE CENTRAL CRIMINAL COURT

Report of the Executive Director and Private Secretary to the Lord Mayor.

For Decision

(Pages 787 - 806)

28. MINOR WORKS MEASURED TERM CONTRACTS - AWARD REPORT

Report of the City Surveyor and Chief Operating Officer.

For Decision (Pages 807 - 822)

29. QUESTIONS ON MATTERS RELATING TO THE WORK OF THE SUB COMMITTEE

- 30. ANY OTHER BUSINESS THAT THE CHAIR CONSIDERS URGENT AND WHICH THE SUB COMMITTEE AGREES SHOULD BE CONSIDERED WHILST THE PUBLIC ARE EXCLUDED
- 31. CONFIDENTIAL MINUTES

For Decision (Supplement)

OPERATIONAL PROPERTY AND PROJECTS SUB COMMITTEE Monday, 5 June 2023

Minutes of the meeting of the Operational Property and Projects Sub Committee held at Committee Rooms, West Wing, Guildhall on Monday, 5 May 2023 at 1.45 pm

Present

Members:

Alderman Timothy Hailes (Chair) Deputy Shravan Joshi (Deputy Chairman) Deputy Randall Anderson Deputy Keith Bottomley Caroline Haines Paul Martinelli

Officers:

Claire Spencer Sonia Virdee Emma Moore Genine Whitehorne Dorian Price Peter Young Sarah Baker Annette Eichie Matthew Stickley CEO, Barbican Centre Chamberlain's Dept. Chief Operating Officer's Chief Operating Officer's Dept City Surveyor's Dept. City Surveyor's Dept. Town Clerk's Dept. Town Clerk's Dept. Town Clerk's Dept.

1. APOLOGIES

Apologies for absence were received from Deputy Christopher Hayward.

Deputy Madush Gupta joined the meeting online.

2. MEMBERS' DECLARATIONS UNDER THE CODE OF CONDUCT IN RESPECT OF ITEMS ON THE AGENDA

There were no declarations of interest.

3. TERMS OF REFERENCE

The Operational Property and Projects Sub-Committee received the Subcommittee's terms of reference.

The committee noted that its membership included two members to be coopted from the Court of Common Council and that, in line with this, expressions of interest had been sought ahead of the meeting. The committee noted that two members – Anett Rideg and Deputy Charles Edward Lord – had submitted expressions of interest, and that Anett Rideg had submitted a statement in support of her nomination. Their cooption was motioned by Alderman Tim Hailes and seconded by Deputy Shravan Joshi.

RESOLVED - that:

- 1. The terms of refence be noted.
- 2. The Anett Rideg and Deputy Charles Edward Lord be coopted as members of the Operational Property and Projects Sub Committee for the 2023-24 civic year.

4. MINUTES

Paul Martinelli requested that the terms of reference for the project governance review and the remit of the external consultant leading the review, Mr Paul Martin, be re-shared with members of the Operational Property and Projects Sub Committee. This was agreed by officers.

RESOLVED – that the public minutes and summary of the meeting held on 17 April 2023 be approved as an accurate record.

5. GW3: CROSSRAIL LIVERPOOL STREET URBAN INTEGRATION (PHASE 2)

The Sub Committee considered a report from the Executive Director Environment regarding the update on phase 2 of the Crossrail Liverpool Street urban integration.

RESOLVED – that the Sub-Committee:

- 1. Noted and approved the contents of the report.
- 2. Approved a change in scope for the project to fund and undertake public consultation exercise for the Liverpool Street area Healthy Streets Plan.

6. GW4: ST. PAUL'S GYRATORY PROJECT – PHASE - 1

The Sub Committee considered a report from the Executive Director Environment concerning the project to transform the streets and public realm between the old Museum of London site and St. Paul's underground station through the partial removal of the 1970s gyratory.

The committee discussed the landscaping works to be undertaken on the site, the potential impact of the proposals on emergency service response times. access to St Bartholomew's Hospital, the displacement of traffic onto nearby roads, and the number of bus spaces these works would create.

In response to questions, officers confirmed that the consultation on the proposals had received a high number of responses and that it would continue through the summer.

An amendment to the recommendations was moved by Alderman Tim Hailes to correct the instructions to officers in line with the City of London Corporation's standing orders.

RESOLVED – that the Sub-Committee:

- 1. Note the approved financial bid for the project of from OSPR and CIL contributions.
- 2. Approves an additional budget of £1,712,050 from the OSPR to reach Gateway 5.
- 3. Note the revised total project budget of £2,947,992 (excluding risk) to reach Gateway 5.
- 4. Note the total estimated cost range of the project.
- 5. Approve the costed risk register and delegated authority to the Executive Director Environment to draw down funds from this.
- 6. Authorise the Executive Director Environment, in consultation with the Chamberlain, to make any further adjustments (above existing authority within the project procedures) between elements of the budget.

7. GW5: PEDESTRIAN PRIORITY STREETS PROGRAMME – PHASE 1

The Sub Committee considered a report from the Executive Director Environment concerning a three-year programme implementing pedestrian priority schemes across the Square Mile to enhance comfort, safety and accessibility for people walking.

The committee discussed taxi access in the area and interest in the proposals from the business community.

An amendment to the recommendations was moved by Alderman Tim Hailes to correct the instructions to officers in line with the City of London Corporation's standing orders.

RESOLVED – that the Sub-Committee:

- Noted the funding strategy prepared to deliver the appropriate scheme outcomes for the best value;
- Note a capital bid of £2m is to be prepared to fund the maintenance elements of the King William Street corridor scheme.
- Authorise the Executive Director Environment, in consultation with the Chamberlain, to make any further adjustments (above existing authority within the project procedures) between elements of the budget.

8. **GW6: BANK STATION UPGRADE – CANNON STREET ENTRANCE S278**

The Sub Committee considered a report from the Executive Director Environment concerning the Section 278 scheme around the new Bank underground station entrance on Cannon Street to reconstruct the public highway and accommodate the requirements of the new development.

The committee discussed the importance of ensuring public access to the station remained.

RESOLVED – that the Sub-Committee approved:

- the content of the outcome report.
- that the final accounts be undertaken.
- that the Chamberlain's department return unspent funds to the Transport for London, including any subsequent refunds returned to the City by third parties; and
- that the project be closed

9. GW6: CONCERT HALL SEATING

The Sub Committee considered a report from the Executive Director Barbican Centre concerning the removal and replacement of Barbican centre concert hall seating, including arm rests and aisle lighting.

RESOLVED – that the Sub-Committee:

• note the lessons learned section of this report and approve formal closure of this project.

10. QUESTIONS ON MATTERS RELATING TO THE WORK OF THE SUB COMMITTEE

There were no questions.

11. ANY OTHER BUSINESS THE CHAIR CONSIDERS URGENT

There were no urgent items.

12. EXCLUSION OF THE PUBLIC

RESOLVED - That under Section 100(A) of the Local Government Act 1972, the public be excluded from the remainder of the meeting on the grounds that the remaining items involve the likely disclosure of exempt information as defined in Part 1 of Schedule 12A of the Local Government Act 1972

13. NON-PUBLIC MINUTES

RESOLVED - The non-public minutes and summary of the meeting held on 17 April 2023 be agreed as an accurate record.

14. GW2: BARBICAN RENEWAL – DESIGN DEVELOPMENT

The Sub Committee considered a joint report from the City Surveyor and the Barbican Centre CEO concerning the design development for elements of a long-term masterplan for the renewal of the Barbican Centre.

15. GW3/4: GUILDHALL – GREAT HALL INTERNAL HEALTH AND SAFETY AND RESTORATION WORKS

The Sub Committee considered a report from the City Surveyor concerning Guildhall great hall internal health and safety and restoration works.

16. GW4: REFURBISHMENT/EXTENSION OF 1-6 BROAD STREET PLACE AND 15-17 ELDON STREET

The committee noted that item 16 had been withdrawn.

17. **GW5: CENTRAL CRIMINAL COURT PLANT REPLACEMENT: PHASE 5** The Sub Committee considered a report from the City Surveyor concerning a report seeking funding to progress with Phase 5 of the central criminal court plant replacement.

18. WALBROOK WHARF STRATEGIC PURCHASE OPPORTUNITY

The Sub Committee considered a report from the City Surveyor concerning an analysis of the known constraints that the Walbrook Wharf strategic properties opportunity may pose.

19. ARCHITECTURAL SERVICES FRAMEWORK – CONTRACT AWARD

The Sub Committee considered a report from the Chief Operating Officer and the City Surveyor concerning a report advising on the outcome in tendering of the Architectural Services Framework (Lots 1,2 and 4).

20. **REWARD REFRESH**

The Sub Committee considered a report from the Chief Operating Officer regarding the City of London Corporation's review of its overall staff reward offer.

The committee noted the item had been considered at the Corporate Services Committee meeting of 31 May 2023 and that members' comments had been shared with the Chief Operating Officer following the meeting.

21. QUESTIONS ON MATTERS RELATING TO THE WORK OF THE SUB COMMITTEE

There were no questions.

22. ANY OTHER BUSINESS THAT THE CHAIR CONSIDERS URGENT AND WHICH THE SUB COMMITTEE AGREES SHOULD BE CONSIDERED WHILST THE PUBLIC ARE EXCLUDED

There were no urgent items.

The Chairman advised the committee that he had agreed to accept late submission of the Reward Refresh report but that as a rule he did not accept late submissions. He advised officers that he was aware of the difficulties the current project procedure created but that compliance with report submission timelines was not an optional requirement of the procedure.

In response to a question, the Chairman advised that so many officers did not need to attend committee meetings and that officers were welcome to leave the meeting at the conclusion of their items.

The meeting ended at 14:49.

Chairman

Contact Officer: Matthew Stickley Matthew.Stickley@cityoflondon.gov.uk

Agenda Item 4

Committees:	Dates:
Streets and Walkways Sub-Committee [for decision]	4 July 2023
Operational Property and Project Sub-Committee [for decision]	3 July 2023
Subject:	Gateway 5
Beech Street Transportation and Public Realm project	Complex
(Phase 1 – Zero Emission Scheme)	
Unique Project Identifier: 10847	
Report of:	For Decision
Executive Director Environment	
Report Author:	
Kristian Turner – Transport and Public Realm Projects, City	
Operations	
PUBLIC	

r	
1. Status	Background:
update	 In November 2022, Members approved consulting the public on the Beech Street Zero Emission scheme.
	 The design of the proposal to be consulted on varied from the previous 18-month traffic experiment by keeping open the junction of Beech Street and Golden Lane.
	3. All other elements of the proposal including the nature of the restriction, signing, access, enforcement infrastructure, closure of the junction of Bridgewater Street and gaps in the central reservation, remain the same as the previous experiment.
	 This report: 4. The purpose of this report is to: Inform Members on the results of the public consultation; Seek Member approval for the recommended option.
	RAG Status: AMBER (Amber at last report to Committee)
	Risk Status: Medium (Medium at last report to Committee)
	Total Estimated Cost of Project (excluding risk): ~ £2.4M (for the zero-emission scheme)
	Spend to Date: £1,951,951 (of a total approved budget of $\pounds 2,285,062$)
	Slippage: ~ 12-18 months

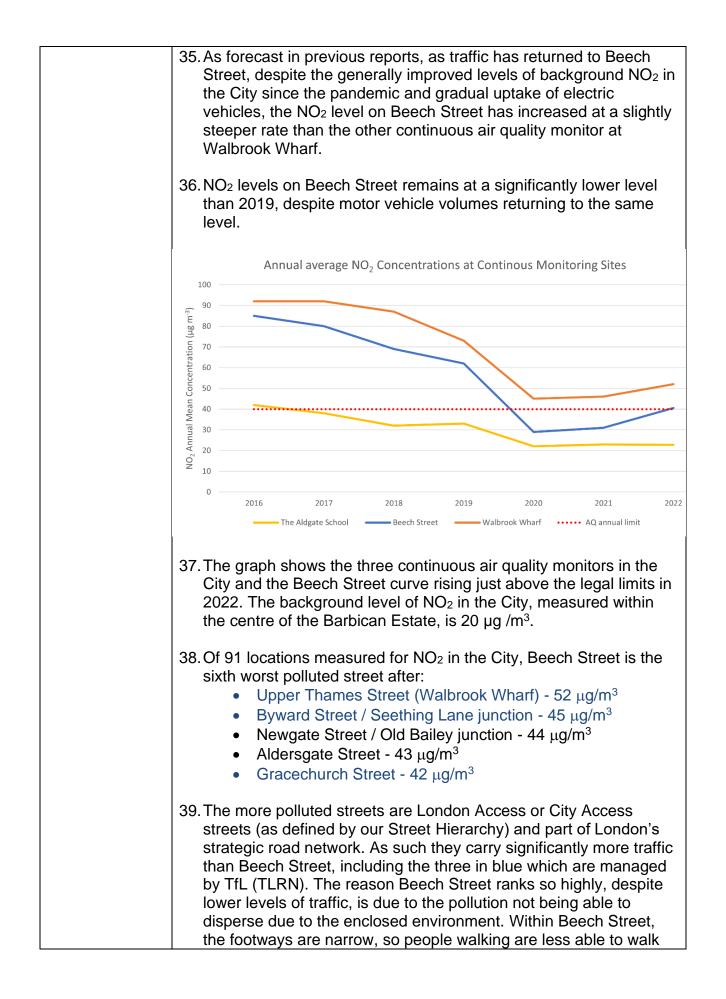
	Eunding Courses Community Infractives Laws (OIL)/OCDD
	Funding Source: Community Infrastructure Levy (CIL)/OSPR
	Costed Risk Provision Utilised: £189k (approved Dec 2021)
2. Next stee and	Requested Decisions
request decisio	
	5. Option 1 – Subject to the scheme receiving approval from TfL make the zero-emission scheme permanent, implementing the scheme as consulted, with the junction of Golden Lane remaining open to motor traffic.
	 Option 2 – do <u>not</u> make the zero-emission scheme permanent, Beech Street and Golden Lane will continue to operate as they do now. Recommended
	Regardless of the option chosen we will continue to work with LB Islington to develop the Barbican, Bunhill and Golden Lane Healthy Neighbourhood Plan (also on the agenda for this meeting).
	In the event that Option 1 is approved, Members of the Streets and Walkways sub-committee are asked to:
	7. Delegate authority to the Executive Director Environment to give notice of the intention to make the necessary traffic orders
	For whatever option is chosen, Members of the Streets and Walkways sub-committee and the Operational Property and Projects sub-committee are asked to approve:
	8. The adjusted project budget (Appendix 2)
	9. The updated Costed Risk Register (Appendix 4)
	Next steps
	 10. If Option 1 is approved, the next steps are to: Seek TfL Approvals under the Traffic Management Act Draft and advertise traffic orders Write to any objectors
	 Report to Committee setting out the details of any objections received (if needed) Procure new ANPR camera for Golden Lane
	 January 2024 – make permanent traffic order
	11. If Option 2 is approved, the existing infrastructure such as signs and cameras would be removed and decommissioned (with the cameras repurposed elsewhere), and the project would be closed via a Gateway 6 Report later this year.

3. Budget	Funding background 12. Before the Fundamental Review was undertaken in 2019,
	provisional funding of £12-£15M had been earmarked for the whole of the Beech Street Transport and Public Realm project, which is one of three elements of the Beech Street Major Transformation which included the Barbican Podiums waterproofing and the refurbishment of the Barbican Exhibition Halls.
	 The Exhibition Hall programme has now been subsumed into the Barbican Renewal project, which is currently entering RIBA Stage 2 and the Podium project is programmed to complete by the end of 2026.
	14. The high level of provisional funding for Beech Street was not confirmed by the Fundamental Review. A Capital bid for £2.5M was therefore approved by RASC in 2021 to fund making the traffic scheme permanent and undertaking public realm improvements, taking the total budget envelope for the Beech Street and Public Realm project to £4.8M.
	15. No public realm improvements have commenced design due to the uncertainty of progressing the traffic scheme element of the project.
	Option Costs
	 Option 1 16. The overall budget allocation would need to be adjusted to communicate and deliver the zero-emission scheme and undertake post-scheme monitoring. See Appendix 2.
	 Option 2 17. The overall budget is sufficient to close down the project with a minor adjustment to the existing budget required, see Appendix 2. A Gateway 6 Report would identify any project underspend.
	18. The development of the Bunhill, Barbican and Golden Lane Healthy Neighbourhood Plan is funded separately. The delivery of any projects emerging from this plan are currently unfunded and would be subject to availability of capital funding through a future capital bid.
	 Option 1 and 2 Costed Risk 19. The Costed Risk Register (Appendix 4) has been amended and increased to reflect the current stage of the project and possible future risks costed. These include providing for £75k to cover staff costs and legal fees in the event of a legal challenge to either decision in this report or to the statutory traffic order making process.

4. Design Summary	Members to de Current The cur Detail of Public of Equaliti Legal ir Officer LEVELS OF WAI 21. The previous of 2021 and Bee unrestricted st 22. Traffic counts These shows pre-pandemic	f the report sets our raw a conclusion or t levels of walking, or rrent situation for ai of the layout of the z consultation results s of the proposal (b ies Impact Assessin mplications conclusion LKING, CYCLING experimental traffic ch Street and Gold rate. on Beech Street we that traffic volumes levels even though 80-85% of pre-par	n the recommend cycling and moto r quality zero-emission res enefits and disbenent AND MOTOR VE scheme conclud en Lane returned ere undertaken ir on Beech Street	ded option: or vehicles striction enefits) EHICLES led in September d to their previous n May 2023. t have returned to n the City is
	Year	Motor Vehicles	Cycles	Walking
	2019	9,423	2,645	16,680
	2023	9,559	3,455	11,880
	on Beech Stre walking along with City-wide 24. The traffic data	a is assessed as re	ecrease in the nu %). The latter is b presenting a true	mber of people proadly consistent e picture of the
		on on Beech Street ic counts undertake		
	levels when ov possible expla network in the Street roundal	why traffic on Beec verall traffic volume mation are the sign City and Islington bout) combined with in the Square Mile.	es across the City ificant changes to (such as Bishops h changes to wor	 have fallen. A both the traffic sgate and Old
	Street and Ch uses Beech S	ertaken origin and c iswell Street to dete treet and Chiswell much to access th	ermine how much Street is using th	n of the traffic that is as a through
	and Chiswell S	ta indicates that tw Street as a through s through traffic) to	route and one th	nird uses the

traffic com	he project area (City fferent picture to Bee pared to 2019 on mo exceeds the general	ech Street, with ost streets. In m	significantly less ost instances the
	ary table below show be found in Appendix		ets of interest, m
	2019	2023	% change
Aldersgate	e St 14,250	11,350	-23%
Fore St	5,350	900	-83%
Golden La	ane 3,300	2,100	-36%
London W	/all 15,200	14,250	-6%
Moor Lane	e 2,600	1,800	-30%
Moorgate	10,400	8,800	-16%
Silk Street	t 900	1,350	+50%
Fortune S	t 1,150	450	-62%
is not knov		mada narmana	
that on oc Street, to	emission scheme is casion unrestricted mitigate the impa g street network.	traffic may be	routed along Be
that on oc Street, to surroundin	casion unrestricted mitigate the impa	traffic may be acts of works	routed along Be
that on oc Street, to surroundin CURRENT SI Beech Street 32. Last year, likely levels	casion unrestricted mitigate the impa g street network. TUATION - AIR QUA	traffic may be acts of works ALITY was undertaker	routed along B elsewhere on
that on oc Street, to surroundin CURRENT SI Beech Street 32. Last year, likely levels scheme wi 33. It was estir	casion unrestricted mitigate the impa g street network. TUATION - AIR QUA air quality modelling s of nitrogen dioxide	traffic may be acts of works ALITY was undertaker (NO ₂), compari	elsewhere on n to forecast the ng the zero-emis

v.April 2019

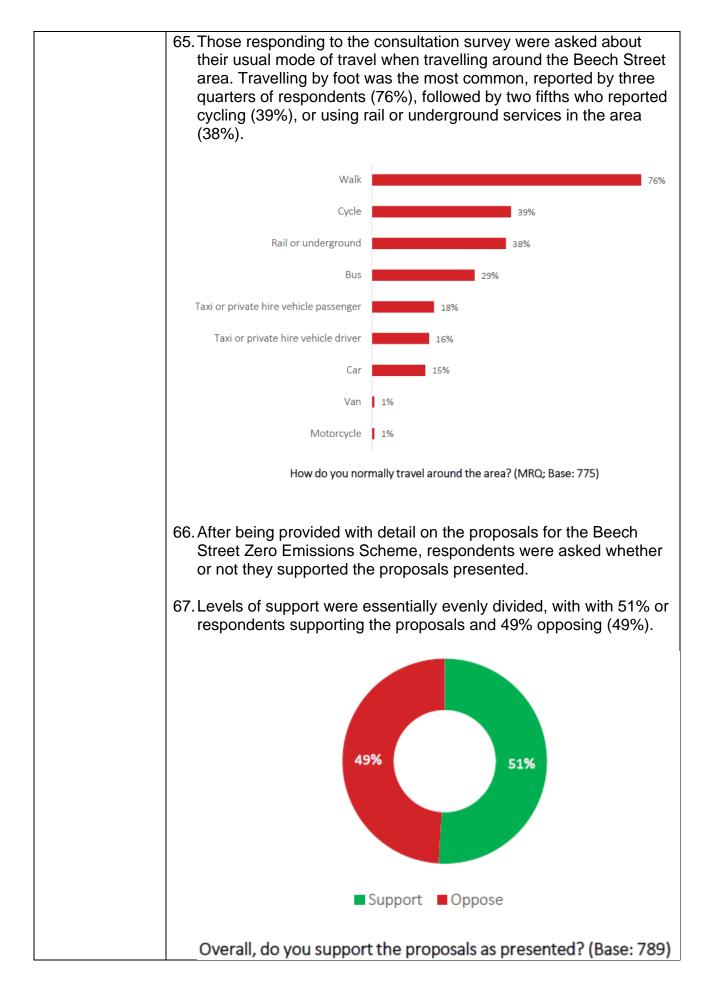


~	P			
	rrounding streets Generally, backgrou	und levels of N	O ₂ across Lon	don continu
40.	improve.			
41.	We have been mor	itoring NO ₂ lev	els on the net	work of stree
	across the project a NO ₂ are significantl			
	of Aldersgate Stree	•		
42.	The NO ₂ has been			
	diffusion tubes attaction tube			
	technology, the tub but can vary in the	-		•
	column by the kerb	, a sign post at	the back of a	footway or i
	proximity to a juncti	on where there	e are more ver	licies accele
43.	A summary of the c	hanges in mea	sured NO ₂ for	· key City str
43.	A summary of the c interest is in the tab	•		• •
43.	interest is in the tab 3). As can be seen,	le below, full re NO2 is signific	esults can be f antly lower at	ound in App many of the
43.	interest is in the tab 3). As can be seen, locations in 2022 co	le below, full re NO2 is signific ompared to 201	esults can be f antly lower at 19. Of particula	ound in App many of the ar note is the
43.	interest is in the tab 3). As can be seen, locations in 2022 co level on Golden La	NO2 is signific NO2 is signific ompared to 201 ne, which is in l	esults can be f antly lower at 19. Of particula	ound in App many of the ar note is the
43.	interest is in the tab 3). As can be seen, locations in 2022 co	NO2 is signific NO2 is signific ompared to 201 ne, which is in l	esults can be f antly lower at 19. Of particula line with gener	ound in App many of the ar note is the
43.	interest is in the tab 3). As can be seen, locations in 2022 co level on Golden La	NO2 is signific NO2 is signific ompared to 201 ne, which is in l	esults can be f antly lower at 19. Of particula	ound in App many of the ar note is the
43.	interest is in the tab 3). As can be seen, locations in 2022 co level on Golden Lau levels of NO ₂ in the	NO2 is signific NO2 is signific ompared to 201 ne, which is in l City.	esults can be f antly lower at 19. Of particula line with gener	ound in App many of the ar note is the ral backgrou
43.	interest is in the tab 3). As can be seen, locations in 2022 co level on Golden Lar levels of NO ₂ in the Location	NO ₂ is signific ompared to 201 ne, which is in 1 City. 2019 47.6 33.5	esults can be f antly lower at 19. Of particula line with gener 2022	ound in App many of the ar note is the ral backgrou
43.	interest is in the tab 3). As can be seen, locations in 2022 co level on Golden Lar levels of NO ₂ in the Location Aldersgate St	NO ₂ is signific ompared to 201 ne, which is in l City. 2019 47.6	esults can be f cantly lower at 19. Of particula line with gener 2022 43.5	ound in App many of the ar note is the ral backgrou % chang -9%
43.	interest is in the tab 3). As can be seen, locations in 2022 co level on Golden Lau levels of NO ₂ in the Location Aldersgate St Fore Street	le below, full re NO ₂ is signific ompared to 201 ne, which is in l City. 2019 47.6 33.5 28.3 48.7	esults can be f cantly lower at 19. Of particula line with gener 2022 43.5 23.5	ound in App many of the ar note is the ral backgrou % chang -9% -33%
43.	interest is in the tab 3). As can be seen, locations in 2022 co level on Golden Lai levels of NO ₂ in the Location Aldersgate St Fore Street Golden Lane London Wall Moor Lane	vile below, full reprint to 2012 NO2 is signific properted to 2011 pared to 2019 47.6 33.5 28.3 48.7 30.2	Ease of the second se	ound in App many of the ar note is the ral backgrou -9% -33% -32% -29% -23%
43.	interest is in the tab 3). As can be seen, locations in 2022 co level on Golden Lai levels of NO ₂ in the Location Aldersgate St Fore Street Golden Lane London Wall	le below, full re NO ₂ is signific ompared to 201 ne, which is in l City. 2019 47.6 33.5 28.3 48.7	esults can be f cantly lower at 19. Of particula line with gener 2022 43.5 23.5 19.2 34.6	ound in App many of the ar note is the ral backgrou % chang -9% -33% -32% -29%

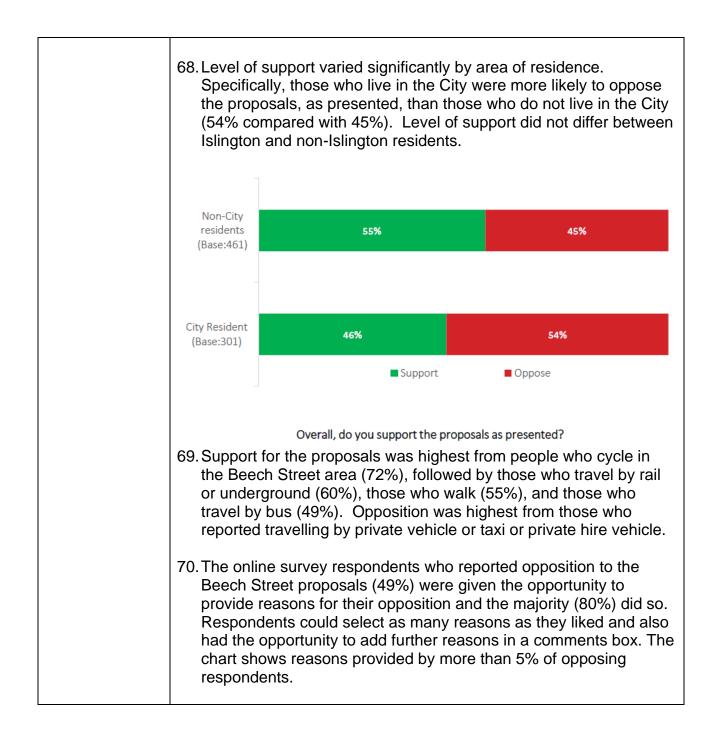
46. If implemented, the design of the zero-emission street would prevent Beech Street being used as a through route by non-zero emission vehicles in both directions. The 153 bus is an electric bus that would be able to continue using Beech Street.
47. Vehicles accessing a property directly off Beech Street will be able to enter Beech Street from either direction but must access their car park or forecourt and not drive straight through without stopping. This will apply to people with car parking spaces for Shakespeare Tower, Defoe House, Lauderdale Place, the forecourt and ground floor car park for Cromwell Tower and the Barbican Trade Centre servicing area.
48. Any type of vehicle such as a car, taxi or delivery vehicle can enter Beech Street if entering one of the car parks or forecourts on Beech Street to make a delivery, drop off/pick up a passenger or park.
49. Other City and Islington residents, businesses, visitors, taxis and general traffic driving a non-zero emission vehicle will need to use an alternative route, which in some instances may increase the length of their journey.
50. Any vehicle travelling south on Golden Lane would be able to turn left onto Beech Street. This means all vehicle types will be able to use the Beech Street eastbound carriageway between Golden Lane and Silk Street.
51. Zero-emission capable vehicles or any vehicle leaving a car park or forecourt on Beech Street or a will be able to turn left on Golden Lane to travel northbound.
52. The central reservation gaps that were constructed in 2021 will be retained, allowing vehicles approaching from the west (Aldersgate Street) to turn right into Lauderdale Place and the Shakespeare Tower/Defoe House car park.
53. The junction of Beech Street with Bridgewater Street will be closed to motorised traffic.
54. The signing for the restriction will be the same as per the experiment. This remains the signing prescribed by the Traffic Signs Regulations and General Directions and which the City received dispensation from the Department for Transport to use the sign and information plate combination. To realise the scheme objectives it is necessary to be able to legally enforce the sign, which was successfully demonstrated during the experiment. This is not to say that that the signage is universally understood by motorists, taxi and delivery drivers.

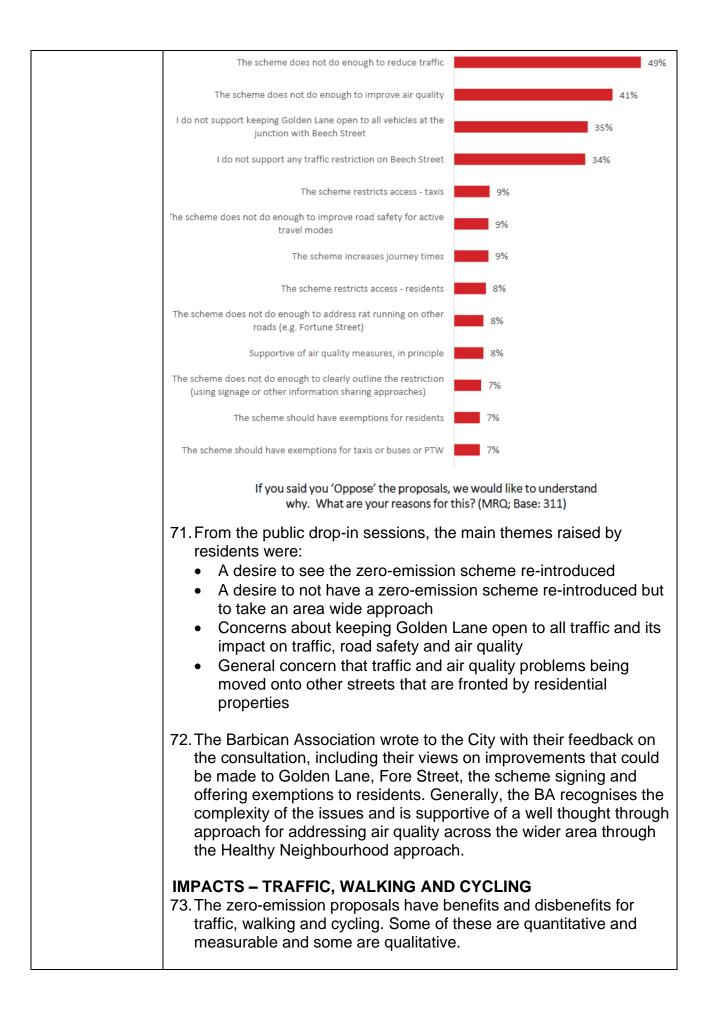
55. The enforcement infrastructure will continue to be based on pairs
of ANPR cameras linked together which are used to determine if a non-compliant vehicle has travelled through Beech Street as through traffic or if it has accessed properties. Keeping Golden Lane open to traffic means another camera needs to be placed on Golden Lane to record any non-compliant vehicles using Beech Street travelling from Aldersgate Street and turning left onto Golden Lane.
56. Emergency vehicles under blue lights will continue to be able to use Beech Street.
LAYOUT UNDER OPTION 2 56. All streets would operate as they do now and the Beech Street central reservation gaps would remain.
PUBLIC CONSULTATION RESULTS
57. The public consultation for Beech Street and the public engagement for the Bunhill, Barbican and Golden Lane Healthy Neighbourhood six weeks from 20 th January to 6 th March.
58. The full public consultation report can be found in Appendix 8.
 59. Members had asked Officers to ensure there was high awareness of the consultation and that as many people as possible were reached. We did this by: Distributing 17,000 leaflets to properties across the whole project area and adjoining areas Placing 40 on street posters across the area to draw attention to the consultation for people on the street
 6 panel vinyls were stuck to the walls within Beech Street Notification of the consultation sent to the Barbican Association and Golden Lane Residents Association

and two at the Viblas and ask any question with City and Islington the area wide Healthy ed the Golden Lane s ty's Beech Street well the previous traffic e dashboard. Insultation consultant tive map explaining the per of questions: Relationship to the B How people normally Overall support for th Reasons if not support	opage featured further information and experiment including an interactive created an online portal featuring an he various elements of the scheme and eech Street area travel around the area
n the previous traffic e dashboard. Insultation consultant tive map explaining the per of questions: Relationship to the B How people normally Overall support for the Reasons if not support	experiment including an interactive created an online portal featuring an he various elements of the scheme and eech Street area travel around the area he proposals ortive of the proposals
tive map explaining the per of questions: Relationship to the B How people normally Overall support for the Reasons if not support	he various elements of the scheme and eech Street area travel around the area e proposals ortive of the proposals
ey live in the City of Lo d that they work in th	%) to the consultation survey reported ondon, and just over a third (34%) e City of London. This compares to slington, and 7% who reported working
I live in the City of London	38%
I work in the City of London	34%
I live in the LB of Islington	16%
to the City of London for business	15%
or to the City of London for leisure	12%
I work in the LB of Islington	
or to the LB of Islington for leisure	- 7%
to the LB of Islington for business	
siness owner in the City of London	
-	
·	
I study in the City of London	
I study in the City of London Other	
	isiness owner in the LB of Islington I am in a Livery Company I study in the City of London



v.April 2019





MOTOR VEHICLES
74. Benefits
 People driving vehicles that are permitted to use Beech Street, and bus passengers on the 153, derive some journey time benefits from having less traffic along the corridor.
75. Disbenefits
 The main disbenefit for people driving non-zero emission capable vehicles is that their journey may be longer. The impact of this disbenefit is highly dependent on the length of journey and its origin and destination. In many instances a journey would not involve needing to use Beech Street, for example a journey from east London with a destination on Silk Street or Moor Lane. Where Beech Street would normally be used it would be possible to adjust the planned route closer to the point of origin to reach the destination without using Beech Street. Of the 9,500 vehicles that use Beech Street on a weekday, the majority will reassign to alternative streets with some journeys reassigning from further away, i.e. vehicles originating from the
 Holborn direction would reassign to Newgate Street rather than use Charterhouse Street and Long Lane Our traffic surveys show that 66% of traffic on the Beech Street/Chiswell Street corridor is "through" traffic. This equates to six thousand vehicles which will reassign primarily to London Wall and Old Street as the alternative east/west routes, with parts of Aldersgate Street and Moorgate also taking more traffic.
 Some traffic with a more local destination will also reassign to streets such as Golden Lane, Wood Street, Fore Street and Moor Lane. It is estimated that for journeys impacted, taking an alternative east/west route via London Wall or Old Street could add a few
 minutes onto a journey depending on time of the day and traffic conditions. Legibility and understanding of the restriction is a likely disbenefit of the scheme. During the experiment there were instances of missed deliveries during the experiment, challenges getting taxis to agree to enter Beech Street to drop off or pick up and people receiving Penalty Charge Notices.
Golden Lane 76. Currently Golden Lane has 30% less traffic than 2019.
77. At briefing sessions held in June, local Members expressed concerns about the reassignment of traffic onto Golden Lane.
78. Based on the data we have and adjusting pre-scheme traffic counts to account for general lower traffic trends post pandemic, it

is broadly estimated that traffic on Golden Lane would increase to be in the region of ~3,200 veh/day. This is a similar to the pre- scheme level of ~3,300 veh/day.
79. This estimate is based on general traffic in the City remaining at 80% of pre-pandemic levels and assumes that most of the traffic that turns left from Aldersgate Street into Beech Street will reassign to Old Street→Golden Lane→Beech Street. This is approximately 1,000 vehicles per day.
80. The levels of traffic on Golden Lane projected is considered acceptable in traffic management terms. Traffic speeds on Golden Lane are low as both the City and Islington are 20mph areas. The street was considered safe by Islington to grant permission to the COLPAI site without further traffic management measures being required by the development.
81. The feasibility of introducing a School Street on Golden Lane will be investigated as part of the Healthy Neighbourhood Plan.
Aldersgate Street 82. Currently Aldersgate Street has 23% less traffic than in 2019.
83. At briefing sessions held in June, local Members expressed concerns about the potential for reassignment of traffic onto Aldersgate Street, particularly the northern section where resident flats are close to the traffic and air pollution.
84. Traffic on Aldersgate Street southbound will partially reduce by ~1,000 a day with this traffic reassigning to Golden Lane, but there will be some reassignment of traffic from Long Lane onto Aldersgate Street northbound. 2019 traffic counts for Long Lane that show ~2,000 vehicles per day go from Long Lane to Beech Street. This traffic will have to turn left or right onto Aldersgate Street.
85. Broadly, based on previous studies that estimate splits of traffic reassigning to Old Street and London Wall, we estimate that there would be some increase in traffic on Aldersgate Street but not to levels any greater than the levels of traffic in 2019.
 WALKNG AND CYCLING 86. Benefits and Disbenefits People walking and cycling on Beech Street will benefit from the reduced exposure to air pollution within Beech Street People walking and cycling on alternate streets which experience an increase in traffic and minor increases in exposure to air pollution.

• The experience and safety of people walking and cycling on Beech Street will be improved as a result of less traffic in Beech Street, but people walking and cycling on some surrounding streets may experience more traffic.
 IMPACTS – AIR QUALITY Benefits 87. The air quality modelling work for Beech Street undertaken by Cambridge Environmental Research Consultants has proven quite accurate for predicting NO₂ levels on Beech Street. Under the "do nothing" scenario was estimated at 39.4 μg/m³ and the annual measurement recorded as 40.6 μg/m³.
88. Under the zero-emission proposal, the modelling done last year indicated that air quality would improve from 39.4 μ g /m ³ to 30.4 μ g/m ³ on Beech Street.
 Disbenefits 89. The air quality modelling suggests some streets in the surrounding area will see minor increases in NO₂ levels under the zero-emission street scheme. These modelled increases are lower than the modelled decreases for Beech Street. See table below.
90. NO ₂ would marginally increase on Old Street, London Wall, Aldersgate Street and Moorgate due to the reassigned traffic, however it should be noted that at some locations the base level of NO ₂ predicted by the model produced last year in the Scenario 1 column is significantly less accurate when compared to measured actual levels of NO ₂ for 2022.

	Scenario 1	Scenario 1 Scenario 2		Scenario 3	
Receptor name	Total	Total	Change	Total	Chan
Beech Street (AQ monitor)	39.4	30.4	-9.0	30.4	-9.0
Beech Street (AQ monitor) – estimate based on new traffic data	40.6	30.4	-10.2	30.4	-10.
Beech Street (East of Golden Lane)	35.9	28.6	-7.3	31.0	-4.9
Beech Street (East of Golden Lane) - estimate based on new traffic data	38.8	28.6	-10.2	31.0	-7.8
Aldersgate Street/Old Street	33.3	36.1	2.7	36.6	3.3
Old Street/Golden Lane	32.1	34.8	2.8	35.4	3.3
Old Street Roundabout	31.4	31.4	0.1	31.4	0.1
Golden Lane (Roscoe Street)	28.4	28.3	-0.1	28.8	0.4
Golden Lane (Fortune Street)	29.4	28.9	-0.4	30.0	0.6
Fortune Street	27.6	27.6	0.0	27.6	0.0
Richard Cloudesley School	28.0	27.9	-0.1	28.1	0.0
Beech Street/Whitecross Street	31.5	27.7	-3.7	28.6	-2.8
Beech Street/Golden Lane	34.0	28.9	-5.1	30.0	-4.0
Beech Street/Aldersgate Street	35.8	30.6	-5.2	30.6	-5.1
Silk Street (Barbican Centre)	28.1	28.2	0.0	28.2	0.1
London Wall Roundabout	36.6	39.4	2.8	39.4	2.8
Aldersgate Street	36.0	36.6	0.7	36.6	0.7
London Wall	29.2	29.3	0.0	29.3	0.0
London Wall	32.0	34.1	2.1	34.1	2.1
London Wall/Moorgate	32.4	34.7	2.3	34.7	2.3
Moorgate/Ropemaker Street	31.9	34.4	2.5	34.4	2.5
Chiswell Street	34.2	34.2	0.0	34.2	0.0
Fann Street	28.6	28.6	0.0	28.6	0.0
Lauderdale Tower	30.5	29.9	-0.6	29.9	-0.6
Shakespeare Tower	28.9	28.6	-0.3	28.6	-0.3
Cromwell Tower	28.0	27.7	-0.3	27.7	-0.2

92. NO₂ levels on Aldersgate Street have been measured at a variety of locations. The modelling had suggested NO₂ levels of 36 but in 2022 was measured at 43, this is partly explained by the diffusion tube being placed near the junction where vehicles accelerate. At briefing sessions Members expressed a concern that residents in flats on Aldersgate Street would experience more pollution if more traffic reassigned to Aldersgate Street. Additional information on

the NO ₂ measured at the facades of buildings is included in Appendix 9.
IMPACTS – EQUALITIES IMPACT ASSESSMENT
93. An independent Equalities Impact Assessment has been undertaken, a copy of the EqIA report is included in Appendix 7.
86. The EqIA identified potential positive impacts of the scheme which are summarised below.
Summary of Road Safety Benefits 87. Younger people (under 16 and 16-24) who are most likely age group to walk will benefit from the improved pedestrian environment in Beech Street
88. People with mobility impairments, people who are pregnant and racial/ethnic groups where people are more likely to walk will find it easier to cross the road due to reduced traffic on Beech Street.
Summary of Air quality improvements 86. Younger and older age groups and pregnant women are disproportionately vulnerable to poor air quality. These groups, and disabled people vulnerable to air pollution such as those with stamina and breathing impairments will disproportionately benefit from the cleaner air on Beech Street.
Improved waiting environment at bus stop 89. The improved air and noise pollution is likely to improve amenity for those more likely to use public transport which include younger and older people, females, disabled users and Black or Black British residents.
90. The EqIA identified potential negative impacts of the scheme which are summarised below.
Increased journey times for non-compliant motor traffic 91. Re-routed journeys may lead to longer journey times for people who rely on private or hire vehicles. This could include people with protected characteristics such as older people (over-60s), people with mobility impairments and pregnant people.
Reduction in taxi availability 92. Non-zero emission capable taxis will not use Beech Street. This will likely reduce the availability to hail a taxi although the numbers of LEVC taxi's as a percentage of the fleet is constantly rising. This will affect older and mobility impaired street users.

 Reduced access to adjacent residential streets 93. The measures are considered likely to disproportionately affect older and disabled residents reliant on family, friends and professionals for daily care. The carers themselves are also more likely to be women and from ethnic groups.
 Perception of personal safety 94. The significantly quieter conditions and levels of passive surveillance at quitter times of the day may make some groups of people feel less safe, these include people from the LGBTQIA+ community, people with a disability/long term health problem, blind and partially sighted people.
 Worsening of air quality on other streets 95. Whilst the impact on air pollution on other streets is less than the improvement on Beech Street, younger and older people, pregnant women and disabled people with respiratory and stamina issues are likely to be the most affected groups.
 LEGAL IMPLICATIONS If Option 1 is chosen 93. The Road Traffic Regulation Act 1984 (RTRA 1984) provides powers to regulate use of the highway. In exercising powers under the RTRA 1984, section 122 of the Act imposes a duty on the City to exercise functions (so far as practicable having regard to the matters set out in the bullet points below) to secure the 'expeditious, convenient and safe movement of vehicular and other traffic (including pedestrians) and the provision of suitable and adequate parking facilities on and off the highway': the desirability of securing and maintaining reasonable access to premises; the effect on amenities of any locality affected and the importance of regulating and restricting the use of roads by heavy commercial vehicles, so as to preserve or improve the amenities of the areas through which the roads run; the national air quality strategy; the importance of facilitating the passage of public service vehicles and of securing the safety and convenience of persons using or desiring to use such vehicles;
94. The procedure relating to the making of experimental traffic orders is set out in the Local Authorities' Traffic Orders (Procedure) (England and Wales) Regulations 1996 and, in particular, regulations 22 and 23.
95. Pursuant to Section 122 of the Road Traffic Regulations Act 1984 the City has also considered whether there is another change that could be made to the street to improve air quality to address the air quality problems which still exist on Beech Street. Options considered include:

a)	Making Beech Street one-way. This would reduce traffic in Beech Street by approximately half and in all probability allow NO ₂ to reach legal limits. Officers have considered the likely impacts of this and judge it as having a greater impact on equalities than the proposed measure as the 153 bus route would need to be rerouted in at least one direction
b)	Make Beech Street zero emission in one direction and unrestricted in the other direction. Officers consider that this approach would be confusing for road users in terms of route planning and access.
c)	<i>Reducing the hours of operation.</i> Officers consider that whilst this option would improve air quality, pedestrian and residential amenity outcomes would be lesser than the proposed option.
pc m	ursuant to Regulation 9(1) of the 1996 Regulations, the City has onsidered the necessity of holding a public inquiry and whereas the otential restrictions do not fit within a category where it is andatory to hold a public inquiry, has decided against holding a ublic inquiry in the exercise of its broad discretion under Regulation
	ne decision to not hold a public inquiry is based on the following vidence: a close version of the proposed restriction has been tested previously the public have a good understanding of how the scheme would
•	work the impacts of the measures on air quality and traffic are well understood
ju	light of these considerations, a public inquiry is not considered stified when taking into account the cost and the knowledge tained from the previous experiment.
99. Tr th se (E re do pla pr	tion 2 is chosen the Local Air Quality Management Framework, underpinned by e Environment Act 1995 and the Air Quality Strategy for England, ets local air quality limits put into place through the Air Quality England) Regulations 2000 (as amended in 2002). The framework equires local authorities to assess the quality of their air and, if it bes not comply with relevant concentration limits, put in place a an to remedy the problem. Local authorities are expected to take reventative action, through a local Air Quality Strategy, rather an waiting for a legal limit to be breached.
100. th	Local authorities' Air Quality Strategies should be informed by eir monitoring and assessments. Air Quality Strategies should

set out a strategy which prioritises reduction of population exposure, including in areas experiencing disproportionately high levels of pollution.
101. It is considered that the air quality issue on Beech Street is now marginal, will likely reduce in the medium term as the uptake of zero emission vehicles increases and that further improvements to Beech Street can be developed as part of the Healthy Neighbourhood Plan.
102. The City has also considered the aspirations of its own Transport Strategy and the London Mayor's Transport Strategy.
103. The recommendations within this report are within the City's powers and duties.
 CONCLUSION 104. The public consultation results demonstrate that the zero- emission scheme is a polarising issue with a wide range of views amongst respondents and participants. The project is particularly complex with significant nuances around the traffic, access and air quality information.
105. The split in the levels of support, combined with marginally exceeding air pollution levels make decision making on the right way to proceed very challenging for Officers and elected Members.
 106. On balance, after briefing local Ward Members on the traffic and air quality situation and considering the benefits and disbenefits of the scheme, Officers recommendation is that the zero-emission scheme as consulted on should not be implemented for the following reasons: The traffic and air quality data shows that even though traffic levels on Beech Street are back to 2019 levels, the levels of NO₂ are now only marginally in breach of legal limits and are significantly below the levels in 2019 when the zero-emission scheme was initiated There is a reasonable expectation that in the medium term the background air quality improvements across London will continue on a downward trajectory, thus bringing Beech Street back into legal compliance Some drivers did not understand the legally compliant signage and therefore some activities such as deliveries and taxi journeys were negatively impacted
 The scheme has some disbenefits with limited increases in traffic and air quality impacts on some surrounding streets There is not majority support amongst City residents for the scheme and support of residents outside the City, whilst a majority was still relatively low at 55%.

		107. Regardless of the option chosen it is proposed to progress at pace the Healthy Neighbourhood project and develop a plan in collaboration with the local community and Islington to address issues and opportunities across the area. This would be more likely to address the consultation responses that pointed to a lack of support because the scheme does not do enough to reduce traffic or improve air quality. The developed plan could include some form of traffic restriction on Beech Street in the future.
5.	Delivery Team	 108. The delivery team for the project is set out below: Project management by the Projects and Programmes team in Policy and Projects. Construction Engineering/Design and Construction Supervision to be managed by Highways team Contractor – FM Conway under the highways term contract.
6.	Programme and key dates	 109. Key dates - Option 1 July/August 2023 - TfL Approvals September 2023 - advertise traffic order October 2023 - objection reconciliation November 2023 - committee objection report (if needed) January 2024 - make permanent traffic order 110. Key Dates - Option 2 September 2023 - Gateway 6 Report to close the project Remove signing and cameras Timelines may vary for both Options if Legal Challenges are received.
7.	Risks	 111. This section summarises the main risks to the project if Option 1 or Option 2 is chosen: Option 1 Legal challenge to the Sub-Committee decision to introduce the zero-emission scheme on Beech Street (likely) Not obtaining the final traffic management approvals from TfL Likelihood of some negative press and negative feeling amongst residents and respondents who do not support the scheme proceeding Option 2 Legal challenge to the Sub-Committee decision to not introduce the zero-emission scheme on Beech Street given that the levels of pollution are currently in breach of legal limits (possible)

		Likelihood of some negative press and negative feeling amongst residents and respondents who supported the scheme by not proceeding
8.	Success criteria	112. The success criteria for the project, to reduce NO ₂ to legal limits is unlikely to be met in the short term with the recommended option but in the medium term as more vehicles become electric it is likely that legal limits will be reached.
9.	Progress reporting	 Option 1 113. Monthly project vision reports will be made. 114. Further issues reports as necessary for timely Member decisions to progress the programme

Appendices

Appendix 1	Project Coversheet
Appendix 2	Finance tables
Appendix 3	NO ₂ (diffusion tube) air quality data
Appendix 4	Costed Risk register
Appendix 5	Traffic counts
Appendix 6	Option 1 – Zero emission scheme layout
Appendix 7	Equalities Impact Assessment
Appendix 8	Public Consultation results report
Appendix 9	NO ₂ Goswell Road and Aldersgate Street

Contact

Report Author	Kristian Turner
Email Address	kristian.turner@cityoflondon.gov.uk

This page is intentionally left blank

This document can only be considered valid when viewed via the CoL Intranet website. If this is printed into hard copy or saved to another location, you must check that the effective date on your copy matches that of the one on-line.

Project Coversheet

[1] Ownership & Status

Unique Project Identifier: 10847

Core Project Name: Beech Street Transport and Public Realm Improvements **Programme Affiliation** (if applicable): Beech Street Transformation **Project Manager:** Kristian Turner **Definition of need:** Public Health.

Key measures of success:

- 1) Reduction in through traffic along Beech Street
- 2) Air quality improvements (reduction in NO₂)
- 3) Vast improvement to quality of the public realm

Expected timeframe for the project delivery:

Original timelines: Gateway 5 – Authority to Start Work – December 2019 Completion – spring 2023

Key Milestones:

G345 – December 2019 Experiment start – March 2020 Experiment end – Sept 2021 Public consultation – Oct 2022 Decision report – Jan 2023

Are we on track for completing the project against the expected timeframe for project delivery? N – The project timelines have slipped and the decision has been taken to consult with the public on the project. The decision report is now a Gateway 5 Report in July 2023.

Has this project generated public or media impact and response which the City of London has needed to manage or is managing?

Y – the project has been in the media and has a profile for the Corporation.

[2] Finance and Costed Risk

Headline Financial, Scope and Design Changes:

Since G1/2 report:

- Total Estimated Cost (excluding risk): £120,525
- Costed Risk Against the Project: 0

Scope/Design Change and Impact: Additional scope, including extensive traffic modelling

Since G3 issues report (S&Ws Approval 22/03/19):

- Total Estimated Cost (excluding risk): £12M-£15M
- Resources to reach next Gateway (excluding risk)

V14 July 2019

This document can only be considered valid when viewed via the CoL Intranet website. If this is printed into hard copy or saved to another location, you must check that the effective date on your copy matches that of the one on-line.

- Spend to date: £585, 217
- Costed Risk Against the Project: 0
- CRP Requested: £125,000
- CRP Drawn Down: 0

Scope/Design Change and Impact: Request to increase project scope to investigate feasibility of a two-way closure.

'Options Appraisal and Design and Authority to Start work' G3-4-5 report (as approved by S&Ws 16/01/2020):

- Total Estimated Cost (excluding risk): Phase 1 budget £1,745,362
- Overall project estimate £12-15m
- Resources to reach next Gateway (excluding risk) £1,160,145
- Spend to date: £585,217
- Costed Risk Against the Project: £125,000
- CRP Drawn Down: None
- Estimated Programme Dates: March 2020 end of 2022 (for Phase 1)

Scope/Design Change and Impact: Authority to proceed with ZES implemented in March 2020

'G5 issues report (as approved by S&Ws 21/10/2020):

- Total Estimated Cost (excluding risk): Phase 1: £2,345,062 (increase in project budget of £515k)
- Overall Project estimate £12-15m
- Resources to reach next Gateway (excluding risk) N/A
- Spend to date: £1,425,333
- Costed Risk Against the Project: £260,000
- CRP Drawn Down: None
- Estimated Programme Dates: March 2020 end of 2022 (for Phase 1)

Scope/Design Change and Impact: Approve increase in budget for staff costs and an increased CRP provision, note impact of judicial review, approve minor changes to design to construct gaps in central reservations

'G5 issues report (as approved by S&Ws 18/02/2021):

- Total Estimated Cost (excluding risk): Phase 1: £2,345,062
- Overall Project estimate £12-15m,
- Spend to date: £1,494,855
- Costed Risk Against the Project: £260,000
- CRP Drawn Down: None
- Estimated Programme Dates: March 2020 end of 2022 (for Phase 1)

Scope/Design Change and Impact: Approve continuation of traffic experiment (with consideration given to impact of the pandemic)

G5 issues report (as approved by S&Ws 15/12/2021):

V14 July 2019

This document can only be considered valid when viewed via the CoL Intranet website. If this is printed into hard copy or saved to another location, you must check that the effective date on your copy matches that of the one on-line.

- Total Estimated Cost (excluding risk): Phase 1:
- Overall Project estimate £
- Spend to date: £1,806,366
- Costed Risk Against the Project: £260,000
- CRP Drawn Down: £189k
- Estimated Programme Dates: March 2020 end of 2022 (for Phase 1)

Scope/Design Change and Impact: Approval to move towards public consultation after conclusion of the experiment

G5 issues report (as approved by S&Ws 15/11/2022):

- Total Estimated Cost (excluding risk): Phase 1:
- Overall Project estimate £ 4.8M
- Spend to date: £1,806,366
- Costed Risk Against the Project: £260,000
- CRP Drawn Down: none since Dec 2021 (£189k)
- Estimated Programme Dates: March 2020 end of 2022 (for Phase 1)

Scope/Design Change and Impact: Approval to move towards public consultation after conclusion of the experiment and negotiations with Islington

Total anticipated on-going commitment post-delivery [£]:N/A Programme Affiliation [£]:N/A This page is intentionally left blank

Appendix 2 Finance tables

Table 1: Spend to Date - 16800068: Beech St Transport Imrpovements						
Description	Approved Budget (£)	Expenditure (£)	Balance (£)			
PreEv Fees	15,000	15,000	-			
PreEv P&T Staff Costs	13,500	13,500	-			
DBE Structures Staff Costs	1,500	-	1,500			
Env Servs Staff Costs	10,499	10,498	1			
P&T Staff Costs	353,044	352,689	355			
P&T Fees	232,636	196,888	35,748			
TOTAL	626,179	588,574	37,605			

Table 2: Spend to Date - 16100423: Beech St Transport Imrpovements							
Description	Approved Budget (£)*	Expenditure (£)	Balance (£)				
Env Servs Staff Costs	85,016	74,018	10,998				
Legal Staff Costs	60,000	56,188	3,812				
P&T Staff Costs	576,250	531,936	44,314				
P&T Fees	449,147	348,573	100,574				
Traffic Mitigation	60,000	46,400	13,600				
Works	37,879	37,878	1				
Purchases	214,240	162,452	51,788				
Cost Risk Provision	71,161	-	71,161				
TOTAL	1,553,693	1,257,445	296,248				

Description	Approved Budget (£)	Expenditure (£)	Balance (£)
P&T Staff Costs	20,490	20,475	15
Architects Fees	30,000	30,000	-
Cost Consultant	10,000	10,000	-
M&E Consultant	9,700	9,700	-
Plan/Heritage Fees	5,000	5,000	-
Project Management	10,000	10,000	-
Retail Assessment	10,000	10,000	-
Structural Fees	10,000	10,000	-
TOTAL	105,190	105,175	15

GRAND TOTAL	2,285,062	1,951,194	333,868

Table 4: Revised budget - Beech St Transport Imrpovements								
Description	Revised Budget to next Gateway (£)							
16800068: Beech St Transpor	t Imrpovements							
PreEv Fees	15,000	-	15,000					
PreEv P&T Staff Costs	13,500	-	13,500					
DBE Structures Staff Costs	1,500	- 1,500	-					
Env Servs Staff Costs	10,499	- 1	10,498					

GRAND TOTAL	2,285,062	20,490	2,305,552
Total	105,190	-	105,190
Structural Fees	10,000	-	10,000
Retail Assessment	10,000	-	10,000
Project Management	10,000	-	10,000
Plan/Heritage Fees	5,000	-	5,000
M&E Consultant	9,700	-	9,700
Cost Consultant	10,000	-	10,000
Architects Fees	30,000	-	30,000
P&T Staff Costs	20,490	-	20,490
16800355: Beech Street (SRI))		
Total	1,553,693	58,095	1,611,788
Cost Risk Provision	71,161	28,839	100,000
Works	214,240	- 30,000	184,240
Traffic Mitigation	37,879	-	37,879
Purchases	60,000	10,000	70,000
P&T Fees	449,147		449,147
P&T Staff Costs	576,250	44,256	620,506
Legal Staff Costs	60,000		60,000
Env Servs Staff Costs	85,016	5,000	90,016
16100423: Beech St Transpo	rt Improvements		
Total	626,179	- 37,605	588,574
P&T Fees	232,636	- 35,749	196,887

Appendix 3 - NO2 Diffusion tube data

Site ID	Location	2019	2022	Reduction (µg/m3)	% Reduction
BS1	Aldersgate Street	47.6	43.5	4.1	8.6
BS2	Aldersgate/ Old Street Junction	60.3	38.2	22.1	36.6
BS3	Golden Lane / Old Street	37.8	26.2	11.6	30.7
BS4	Golden Lane / Baltic Street	34.9	23.8	11.1	31.9
BS5	Golden Lane / Banner Street	29.5	20.9	8.6	29.1
BS6	Old St / Whitecross St	37.9	26.0	11.9	31.4
BS7	Garrett Street	33.1	22.5	10.6	32.0
BS8	Banner Street	33.3	20.1	13.2	39.6
BS9	Fortune Street	30.7	23.3	7.4	24.3
BS10	Golden Lane / Fortune Street	28.3	19.2	9.1	32.0
BS12	Old Street Roundabout	52.7	31.1	21.6	41.0
BS13	Bunhill Row/ Dufferin Street	30.1	23.4	6.7	22.2
BS14	Bunhill Row/Chiswell Street	40.3	27.9	12.4	30.7
BS15	City Road/ Chiswell Street	58.0	32.7	25.3	43.6
BS16	Moore Lane/ Ropemaker Street	34.0	25.1	8.9	26.3
BS17	Moorgate	51.8	31.2	20.6	39.7
BS18	London Wall/ Moorgate	51.8	36.1	15.7	30.4
BS19	London Wall	48.7	34.6	14.1	28.9
BS20	Wood Street	29.4	20.7	8.7	29.8
BS21	Goswell Road	-	34.7	-	-
LEN3	Beech Street- Barbican Station	50.4	36.7	13.7	27.2
LEN4	Aldersgate	47.2	43.0	4.2	8.9
LEN6	Whitecross Street / Beech street	39.6	26.2	13.4	33.8
LEN7	Silk Street	35.6	23.9	11.7	32.9
LEN8	Fore Street	33.5	22.5	11.0	32.8
LEN15	Fann Street	35.5	24.6	10.9	30.7
LEN 16	Moor Lane	30.2	23.2	7.0	23.2

This page is intentionally left blank

City of London: Projects Procedure Corporate Risks Register

	<u>or condo</u>		cedure Corporate	Kisks kegister				-			_			_						_			_
	P	roject Name:	Beech Street Tra	nsport and Public	Realm In	nproveme		PM's overall risk rating:	Medium		CRP requested this gateway	£	100,000	unm	Average itigated risk			6.0			Open Risks	2	
Ur	nique pro	ject identifier:	10847				Total	estimated cost (exc risk):	£	4,800,000	Total CRP used to date	£	-	Averag	e mitigated risk score			6.0		· ·	Closed Risks	6 O	
Gene	ral risk class			-							Mitigation actions			_					Ownership	& Action			
Risk ID	Gateway	Category	Description of the Risk	Risk Impact Description	Likelihood Classificatio n pre- mitigation	Impact Classificatio n pre- mitigation	Risk score	Costed impact pre- mitigation (£)	Costed Risk Provisio requested Y/N	n Confidence in the estimation	Mitigating actions	Mitigation cost (£)	Likelihood Classificat on post- mitigation	i Classificat ion post-	mitigation (£)	Mitiga		Use of CRP	Date raised	Named Departmental Risk Manager/ Coordinator	Risk owner (Named Officer or External Party	Date Closed OR/) Realised & moved to Issues	Comment(s)
R1	6	(1) Compliance/Reg ulatory	Legal Challenge to a permanent traffic order	Challenge on procedural or other grounds relating to the traffic order	Likely	Serious	8	£75.000.00	Y - for costed impact post-mitigation	A – Very Confident	There is no real mitigation as the event of a Legal Challenge is completely out of the City's control	£0.	00 Likely	Serious	£75,000.00	8	£0.00	Possible: Legal and DB staff time, externo Legal fees, consultanc wor	E JI y k	Gillian Howard	Kristian Turner		Given the nature of the scheme and the scale of public interest, it is considered likely that further legal challenges, such as a Public Enquiry may be forthcoming
R2	6	(1) Compliance/Reg ulatory	Delays to TfL approving the TMAN for the permanent traffic order	There may be delays to the TMAN approval if IfL have any concerns relating to the impact of a permanent scheme on the network	y Unlikely	Serious	4	£25,000.00	Y - for costed impact post-mitigation	B – Fairly Confident	Continue to prepare for the data and constantly liaise with TfL teams	£0.	00 Unlikely	Serious	£25,000.00	4	£0.00	Possible: Staff time - modelling	+ g	Gillian Howard	Kristian Turner		In theory TfL have 28 days to approve or reject a TMAN.
																	£0.00	D					
R12 R13																							
R14 R15								£0.00				£0.	00		£0.00		£0.00	D					
R16 R17								£0.00 £0.00				£0. £0.			£0.00 £0.00		0.03 00.03						
R18 R19								£0.00 £0.00				£0. £0.			£0.00 £0.00		0.03 00.03						
R20 R21								£0.00 £0.00 £0.00				.0£			£0.00 £0.00		£0.00 £0.02						
R22 R23								£0.00 £0.00				£0. £0.	00		£0.00 £0.00		£0.00 £0.00						
R24 R25								£0.00 £0.00				£0. £0.	00		£0.00 £0.00		£0.00 £0.00	D					
R26 R27				+				£0.00 £0.00				£0. £0.	00		£0.00 £0.00		£0.00 £0.00	D	1				
R27 R28 R29						1		0.00 £0.00 £0.00 £0.00				£0. £0.	00	1	£0.00 £0.00 £0.00		£0.00 £0.00	D	1			1	
R30								£0.00				£0.	00		£0.00		£0.00	0					
R31 R32								00.03 £0.00				£0. £0.	00		£0.00 £0.00		£0.00 £0.00	D					
R33 R34								£0.00 £0.00				£0. £0.	00		£0.00 £0.00		£0.00 £0.00	D		<u> </u>			
R35 R36				<u> </u>				£0.00 £0.00				£0. £0.	00		£0.00 £0.00		£0.00 £0.00						
R37 R38								£0.00 £0.00				£0. £0.	00		£0.00 £0.00		£0.00 £0.00	D					
R39 R40								£0.00				£0. £0.	00		£0.00 £0.00		£0.00 £0.00	D					
R41 R42					-	1		£0.00 £0.00 £0.00				£0. £0.	00	-	£0.00 £0.00		£0.00	D	1	-	-	1	
R43						1	<u> </u>	£0.00 £0.00 £0.00				£0. £0.	00	1	£0.00		£0.00	D	1	1	1	1	
R44 R45								£0.00 £0.00 £0.00		1	1	£0.	00		0.00£		£0.00 £0.00	D					1
R46 R47								£0.00 £0.00 £0.00				£0. £0.	00		£0.00 £0.00		£0.00 £0.00	D					
R48 R49								0.00£ 0.00£				£0. £0.	00		£0.00 £0.00		£0.00 £0.00	D					
R50 R51								£0.00 £0.00				£0. £0.	00		£0.00 £0.00		£0.00 £0.00	0					
R52								£0.00		+		£0.	00		£0.00		£0.00	D					1
R53 R54				<u> </u>				£0.00 £0.00				£0. £0.	00		£0.00 £0.00		£0.00 £0.00	D					
R55								£0.00				£0.			£0.00		£0.00						

R56			£0.00		£0.00	£0.00	£0.00			
R57			£0.00		£0.00	£0.00	£0.00			
R58			£0.00		£0.00	£0.00	£0.00			1
R59			£0.0£		£0.00	£0.00	£0.00			
R60			£0.00		£0.00	£0.00	£0.00			1
R61		1 1	£0.00		£0.00	£0.00	£0.00			. <u></u>
R62			£0.00		£0.00	£0.00	£0.00			
R63		1 1	£0.00		£0.00	£0.00	£0.00			. <u></u>
R64			£0.00		£0.00	£0.00	£0.00			
R65			£0.00		£0.00	£0.00	£0.00			
R66			£0.00		£0.00	£0.00	£0.00			
R67		1 1	£0.00		£0.00	£0.00	£0.00			. <u></u>
R68		1 1	£0.00		£0.00	£0.00	£0.00			
R69		1 1	£0.00	1	£0.00	£0.00	£0.00			
R70		1 1	£0.00		£0.00	£0.00	£0.00	1		· · · · · · · · · · · · · · · · · · ·
R71			£0.00		£0.00	£0.00	£0.00			
R72		1 1	£0.00		£0.00	£0.00	£0.00			· · · · · · · · · · · · · · · · · · ·
R73			£0.00		£0.00	£0.00	£0.00			1
R74		1 1	£0.00		£0.00	£0.00	£0.00			· · · · · · · · · · · · · · · · · · ·
R75		1 1	£0.00		£0.00	£0.00	£0.00			
R76		1 1	£0.00		£0.00	£0.00	£0.00			. <u></u>
R77		1 1	£0.00		£0.00	£0.00	£0.00			
R78		1 1	£0.00		£0.00	£0.00	£0.00			·
R79		1 1	£0.00		£0.00	£0.00	£0.00			1
R80			£0.00		£0.00	£0.00	£0.00			
R81		1 1	£0.00		£0.00	£0.00	£0.00			. <u></u>
R82			£0.00		£0.00	£0.00	£0.00			
R83		1 1	£0.00		£0.00	£0.00	£0.00			. <u></u>
R84		1 1	£0.00		£0.00	£0.00	£0.00			. <u></u>
R85			£0.00		£0.00	£0.00	£0.00			
R86			£0.00		£0.00	£0.00	£0.00			
R87			£0.00		£0.00	£0.00	£0.00			·
R88			£0.00		£0.00	£0.00	£0.00			·
R89			£0.00		£0.00	£0.00	£0.00			
R90			£0.0£		£0.00	£0.00	£0.00			
R91			00.0£ 00.0£		£0.00	£0.00	£0.00			
R92					£0.00	£0.00	£0.00			
R93		l İ	£0.00		£0.00	£0.00	£0.00			
R94			£0.0£		£0.00	£0.00	£0.00			
R95			£0.0£		£0.00	£0.00	£0.00			
R96			£0.0£		£0.00	£0.00	£0.00			
R97			£0.0£		£0.00	£0.00	£0.00			
R98			£0.0£		£0.00	£0.00	£0.00			
R99			£0.00		£0.00	£0.00	£0.00			
R100			£0.0£		£0.00	£0.00	£0.00			
			•		•	•				

	Vehicles 2019	Vehicles 2020	Vehicles 2023	% Change between 2019/23
Aldersgate Street	14,283	11,168	11,365	-23%
Banner Street (East of Golden Lane)	972	623	756	-44%
Bath Street	3549	3,920	995	-72%
Beech Street (Between Golden Lane and	5545	5,520		12/0
Bridgewater Street)	7794	3,920	7,797	0%
Beech Street (Between Golden Lane and	,,,,,,	5,520	1,151	070
Whitecross Street)	8702	2,312	9,015	4%
Bunhill Row between the junctions of Lambs		, -	- ,	· · · · ·
Passage and Dufferin Street	2,068	1,794	1,417	-31%
Bunhill Row north of Chequer Street	2,300	1,755	1,400	-39%
Central Street south of Gee Street	4,334	2,489	4,098	-5%
City Road North of Olivers Yard	7,681	5,036	6,116	-20%
Dufferin Street (West of Bunhill Row)	690	390	394	-43%
Fore Street (East of St Giles Circus)	5,375	1,864	904	-83%
Fortune Street (East of Golden Lane)	1,128	262	427	-62%
Golden Lane (South of Roscoe Street)	3,318	1,069	2,118	-36%
Goswell Road (South of Baltic Street)	15,490	11,791	11,075	-28%
London Wall (East of Wood Street	15,192	15,934	14,242	-6%
Milton Street (North of Milton Court)	1,434	679	970	-32%
Moor Lane (North of New Union Street)	2,594	437	1,806	-30%
Moorgate (South of South Place)	10,374	11,271	8,761	-16%
Old Street (East of Goswell Road)	11,676	13,540	8,473	-27%
Silk Street (West of Milton Street)	909	764	1,361	50%
Whitecross Street (South of Roscoe Place)	302	211	264	-13%
Total	120,165		93,754	-22%

TRAFFIC COUNTS 0600-2200

Page 48

This page is intentionally left blank



Access map





This map is reproduced from Ordnance Survey material with the permission of Ordnance Survey on behalf of the controller of Her Majesty's Stationery Office All rights reserved. Unauthorised reproduction infringes Crown copyright and may lead to prosecution or civil proceedings. City of London 100023243 2022. Page 50

This page is intentionally left blank

Draft Report June 2023

Beech Street Zero Emission Scheme: Equality Impact Assessment (EqIA)



City of London Corporation 24398703



Page 51

Draft Report June 2023

Beech Street Zero Emission Scheme: Equality Impact Assessment (EqIA)

Prepared by:

Prepared for:

Steer 14-21 Rushworth Street London SE1 ORB

+44 20 7910 5000 www.steergroup.com City of London Corporation Guildhall London EC2P 2EJ

24398703

Steer has prepared this material for City of London Corporation. This material may only be used within the context and scope for which Steer has prepared it and may not be relied upon in part or whole by any third party or be used for any other purpose. Any person choosing to use any part of this material without the express and written permission of Steer shall be deemed to confirm their agreement to indemnify Steer for all loss or damage resulting therefrom. Steer has prepared this material using professional practices and procedures using information available to it at the time and as such any new information could alter the validity of the results and conclusions made.

steer

Contents

1	Introduction	1
	Background	1
	Scheme context	1
2	Scoping	1
3	Data Sources	3
4	Baseline Evidence	6
	Workforce	6
	Users of Beech Street	7
	Age	9
	Disability1	3
	Pregnancy and maternity1	8
	Race1	9
	Religion and belief2	2
	Sex	3
	Sexual orientation	6
	Gender reassignment 2	8
5	Impact Assessment	0
	Potential disproportionately positive impacts	1
	Potential disproportionately negative impacts	3
6	Summary of recommended mitigating actions 3	8

Figures

Figure 1.1: Proposed permanent scheme	0
Figure 3.1: Study Area consisting of six LSOAs across City of London and Islington	4
Figure 3.2: MSOA level Study Area consisting of three MSOAs across the City of London and Islington	4
Figure 4.1: Method of travel to work for those with a workplace in the City of London	6
Figure 4.2: Method of travel to work for employed residents of the Study Area	7
Figure 4.3: Beech Street users, November 2022	8

Figure 4.4: Age distribution in the Study Area, compared to City of London and Greater London in 2021.	
Figure 4.5: Mode share by age in City of London1	0
Figure 4.6: Mode share by age in Greater London1	1
Figure 4.7: Percentage Killed or Seriously Injured by age in City of London (2021) 1	2
Figure 4.8: Population limited by long-term health problems or disabilities in the study area, City of London and Greater London1	3
Figure 4.9: Impairment types stated by those with an impairment affecting travel in City of London	4
Figure 4.10: Mode share of those with a long-term health problem or disability in City of London	5
Figure 4.11: Mode share of those with a long-term health problem or disability in Greater London	5
Figure 4.12: Mode share of those with a specific impairment affecting daily travel in City of London	6
Figure 4.13: Mode split by those with a specific impairment affecting daily travel in Greater London	7
Figure 4.14: General Fertility Rate per year in City of London and Hackney compared to the Greater London average	8
Figure 4.15: Study Area and City of London ethnicity compared to London and national averages1	9
Figure 4.16: Mode share by ethnicity in City of London	0
Figure 4.17: Mode share by ethnicity in London	1
Figure 4.18: Religion composition in the Study Area, City of London, and Greater London 2	2
Figure 4.19: Population breakdown by sex in the Study Area, City of London, and Greater London	3
Figure 4.20: Mode share by sex in City of London	4
Figure 4.21: Mode share by sex in Greater London	4
Figure 4.22: Sexual orientation composition for the MSOA level Study Area and Greater London	6
Figure 4.23: Gender composition of the MSOA-level Study Area and Greater London	8

Tables

Table 2.1: Protected characteristics scoping	2
Table 5.1: Protected characteristics impacted	30
Table 6.1: Action Plan	39

1 Introduction

Background

- 1.1 This Equality Impact assessment (EqIA) relates to the proposed zero emission street, Beech Street, located within the City of London. An EqIA is a process designed to ensure that a policy, project, or scheme does not unlawfully discriminate against any protected characteristic as defined by the Equality Act 2010. This EqIA has been produced by the independent transport and infrastructure consultancy, <u>Steer</u>.
- 1.2 In 2020, the City ran an 18-month traffic experiment on Beech Street to reduce NO₂ levels. The experiment restricted polluting traffic from using Beech Street as a through route 24 hours a day, 7 days a week. Unrestricted access was allowed for zero-emission capable vehicles and for any vehicle accessing properties and car parks on Beech Street.
- 1.3 When the experimental scheme finished in September 2021, the traffic restrictions were removed. The City has now developed a new proposed scheme for Beech Street, working in collaboration with Islington Council, and is in the process of deciding whether the scheme should be made permanent. This EqIA provides an assessment of the potential disproportionate impacts of the proposed permanent scheme on people who share one or more protected characteristics.
- 1.4 Steer has identified three potential disproportionately positive impacts and five potential disproportionately negative impacts.

Scheme context

- 1.5 The proposed permanent scheme for Beech Street involves the following:
 - Only zero-emission vehicles are permitted to drive through Beech Street
 - All vehicles (including deliveries, taxis, and visitors) can access Beech Street only if accessing car parks / forecourts
 - Bridgewater Street junction is closed to all vehicles except cyclists
 - All vehicle types are permitted to enter Beech Street from Golden Lane, though are prevented from turning right out of this junction
 - Only zero-emission vehicles are permitted to enter Golden Lane from Beech Street
 - Vehicle movements will be enforced by Automatic Number Plate Recognition (ANPR)
- 1.6 A map of the proposed changes is presented overleaf in Figure 1.1.

steer

Beech Street Zero Emission Scheme: Equality Impact Assessment (EqIA) | Draft Report

Figure 1.1: Proposed permanent scheme



Assumed impact on transport and movement

- 1.7 The impacts identified throughout this EqIA are derived from the assumption that the proposed scheme will have the following impacts on transport and movement in the area:
 - The proposed scheme will reduce the overall volumes of motor traffic along Beech Street
 - The expected reduction in motorised traffic on Beech Street will improve road safety, making it more pleasant for pedestrians walking and crossing the street.
 - Expected reductions in emissions will improve the air quality for everyone using Beech Street. Air quality modelling forecasts a reduction of NO₂ on Beech Street (at the air quality monitor western end) from 39.4 μ g/m³ to 30.4 μ g/m³ and reduction of NO₂ on Beech Street between Golden Lane and the eastern entrance to Beech Street from 38.8 μ g/m³ to 31 μ g/m³.
 - Reduced volumes of motorised traffic and better air quality will facilitate a more pleasant experience for bus passengers waiting at the bus stop on Beech Street.
 - Re-routing of journeys (due to restrictions on non-compliant cars restricted from Beech Street) may increase journey times for people dependant on private vehicles / taxis as they would have to take alternative routes to avoid Beech Street.
 - Consequently, taxi journeys may become lengthened and therefore more expensive, impacting those reliant on taxis. It is important to note however that 40 percent of all black cabs in London are now electric, and the taxi fleet is continually growing its share of electric vehicles, so this impact may reduce in severity over time¹.
 - Adjacent residential streets (Bridgewater Street, Brackley Street, Viscount Street and Fann Street) will experience minor reductions in accessibility from non-compliant motor vehicles as they would no longer be accessible from Beech Street.

¹ London Now Has More Electrified Black Cabs Than Diesel Taxis (insideevs.com)

2 Scoping

- 2.1 A scoping assessment has been undertaken to identify whether the proposed scheme could have a disproportionate impact on people with one or more protected characteristics.
- 2.2 "Disproportionate impact" means that groups of people who share a protected characteristic may be significantly more affected by a change than other people.
- 2.3 Protected characteristics are defined by the Equality Act 2010. The 'protection' refers to protection from discrimination. There are nine characteristics protected by the Equality Act:
 - Age
 - Disability
 - Gender reassignment
 - Marriage and civil partnership
 - Pregnancy and maternity
 - Race
 - Religion or belief
 - Sex
 - Sexual orientation
- 2.4 It is not considered that the 'marriage and civil partnership' protected characteristic has a significant intersection with movement and space. Therefore, it has not been included in the evidence base and detailed consideration of equalities impacts that follows.
- 2.5 This exercise considers both potential positive and negative impacts, and, where possible, provides evidence to explain how and why a group might be particularly affected. Table 2.1 provides a summary of the scoping assessment.

Table 2.1: Protected characteristics scoping

Protected characteristic	Disproportionate impact unlikely	Disproportionate impact possible	Commentary
Age: People in particular age groups (particularly over 65s and under 16s)		✓	There is likely to be a disproportionate effect which this EqIA will investigate. person's ability to use the transport network can be reduced as a result of age and age-related health conditions.
Disability: People with disabilities (including different types of physical, learning or mental disabilities)		√	There is likely to be a disproportionate effect which this EqIA will investigate. A person's use of the transport network can be shaped by certain disabilities.
Gender reassignment: People who are intending to undergo, are undergoing, or have undergone a process or part of a process of gender reassignment		√	There is likely to be a disproportionate effect which this EqIA will investigate.
Marriage and civil partnership: People who are married or in a civil partnership	√		People who are married or within civil partnerships are unlikely to be disproportionately impacted by the scheme.
Pregnancy and maternity: People who are pregnant or have given birth in the previous 26 weeks		V	There is likely to be a disproportionate effect which this EqIA will investigate. A person's use of the transport network can be shaped by pregnancy and parental care.
Race : People of a particular race or ethnicity (including refugees, asylum seekers, migrants, gypsies and travellers)		J	There is likely to be a disproportionate effect which this EqIA will investigate. Use of the transport network and/or occupation may differ depending on ethnic group.
Religion or belief: People of particular faiths and beliefs		√	There is likely to be a disproportionate effect which this EqIA will investigate.
Sex : Whether people are male or female		J	There is likely to be a disproportionate effect which this EqIA will investigate. Use of the transport network and/or occupation may differ depending on sex.
Sexual orientation: Whether a person's sexual orientation is towards the same sex, a different sex, or both.		√	There is likely to be a disproportionate effect which this EqIA will investigate.

3 Data Sources

3.1 For this assessment, information has been gathered about protected characteristics from the following output areas:

- 2021 Lower Layer Super Output Areas (LSOAs)
 - City of London: 001A, 001B, 001C
 - Islington: 022H, 023D, 023E
- 2021 Mid Layer Super Output Areas (MSOAs)
 - City of London: 001
 - Islington: 022, 023
- Data for Greater London
- 3.2 For all protected characteristics, aside from Sexual Orientation and Gender Reassignment, the cumulative data for the six LSOAs is referred to as the 'Study Area'. Here, borough level data is taken from the City of London (001) MSOA only.
- 3.3 For the protected characteristics of Sexual Orientation and Gender Reassignment, LSOA-level data is not currently available. Therefore, the cumulative data for the three MSOAs is used to substitute both local and borough-level data. This is referred to as the 'MSOA level Study Area'.
- 3.4 The City of London is a small and densely populated area with high levels of walkability and numerous public transport stations. This means that any given street is likely to be used by people from across the City. Therefore, it is important to consider an area that is wider than the immediate surroundings of the scheme; this requirement is satisfied by the use of MSOA data.
- 3.5 As the Beech Street scheme is located near the boundary between the City of London and the London Borough of Islington, it is expected that the scheme will impact some residents of Islington. Therefore, some areas of Islington as included in this analysis. London as a whole is included in the assessment to provide greater context to the data for residents living in the Study Area and the City of London.
- 3.6 The LSOAs and MSOAs used in this assessment are illustrated below in Figure 3.1 and Figure 3.2 respectively.

steer

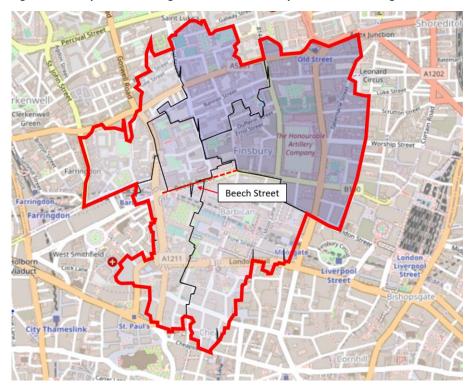


Figure 3.1: Study Area consisting of six LSOAs across City of London and Islington

Source: Nomis 2023

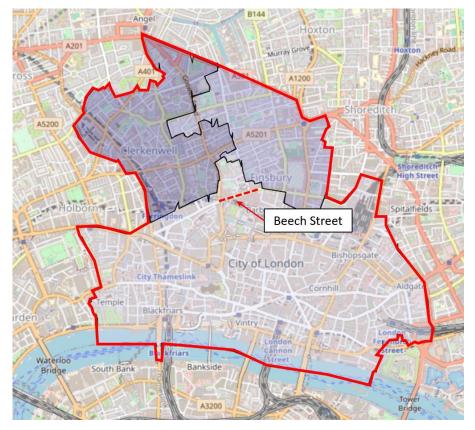


Figure 3.2: MSOA level Study Area consisting of three MSOAs across the City of London and Islington

Source: Nomis 2023



Data sources and limitations

- 3.7 The London Travel Demand Survey (LTDS) and Census 2021 data are the two primary data sources used throughout this assessment. Supplementary data sources have also been used and are referenced throughout. For each protected characteristic, data has been collated and analysed, with comparisons made at LSOA/MSOA, Borough, London and national levels, where relevant.
- 3.8 While Census data is a useful tool for understanding and comparing travel characteristics of one area with another, it does have limitations. The 2021 Census dataset is expected to have been influenced by alterations to ways of living and moving during the Covid-19 pandemic period.
- 3.9 LTDS data provides granular data within the City of London, however it is not wholly representative of the wider population as it is calculated using sample sets and subsequently scaled up. Throughout this report, acknowledgement has been made where the sample of LTDS data is particularly small.

steer

4 Baseline Evidence

Workforce

- 4.1 The City of London has a very large workforce in comparison to its usual residential population. The 2011 Census recorded the residential population as 7,400 people and the work force as 357,000 people almost 50 times the usual residential population which demonstrates significant movement in and out of the City every day.
- 4.2 Office for National Statistics (ONS) mid-2019 estimates show an increase in the City of London residential population to 9,700 people while the 2018 workforce was estimated to be 522,000². The City shows the highest workplace density out of all boroughs in Greater London with the primary land use in the City being offices, which make up more than 70 per cent of all buildings. In absolute terms, the City has the second greatest workforce after the City of Westminster, with a gender split of 64 per cent males and 36 per cent females in 2019³.
- 4.3 When compared to Greater London, the City of London has a higher proportion of professional occupations, associated professional and technical occupations, skilled trades occupations, and administrative and secretarial occupations. Professional and associate professional/technical occupations represent over half of occupations within the City.
- 4.4 Census 2011 data shows that of those travelling to the City of London for work, 38 per cent have trips of 10km or less. 36 per cent of trips are between 10km and 30km, while 16 per cent are within 30km and 50km and 9 per cent are 60km or more. Overall, 84 per cent of the workforce uses public transport to travel to the City of London for work, shown in Figure 4.1.

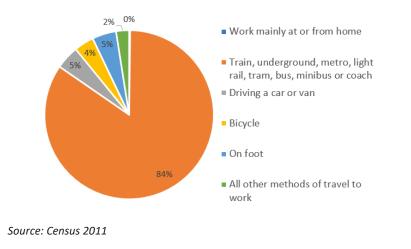
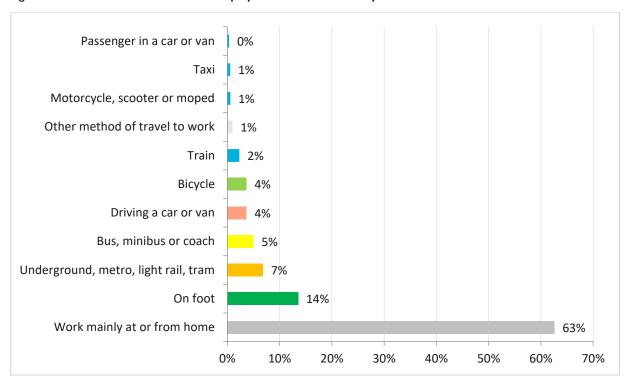


Figure 4.1: Method of travel to work for those with a workplace in the City of London.

² <u>https://www.cityoflondon.gov.uk/supporting-businesses/economic-research/statistics-about-the-city</u>

³ https://www.citywomen.co.uk/wp-content/uploads/2020/02/city-of-london-jobs-factsheet.pdf

4.5 Recent data from the 2021 Census shows methods of travel to work for those living in the Study Area who are in employment. This is shown in Figure 4.2. It is worth noting that these results are impacted by altered working patterns due to Covid-19 restrictions; consequently, a large proportion (63 per cent) for residents worked mainly at or from home. The most prevalent method of travel was on foot (14 per cent), followed by TfL Underground/DLR services (7 per cent). Only 4 per cent of trips were done driving a car or van, and under 1 per cent as a passenger in a car or van.





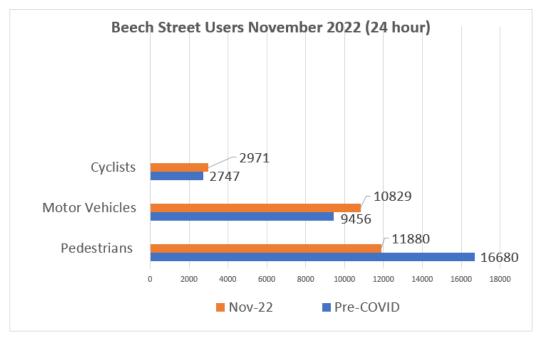
Source: Census 2021

Users of Beech Street

4.6 As shown in Figure 4.3, over an average 24 hours in November 2022, 11,880 pedestrians used Beech Street. Despite this number being lower than its pre-COVID level of 16,680, it is still greater than the numbers of other road users (motor vehicles and cyclists) who have seen increases in numbers since pre-COVID levels.

steer





Source: City of London, 2023

steer

Page 66

Age

Definition according to the Equality Act 2010

- 1. In relation to the protected characteristic of age:
 - a. A reference to a person of a particular age group
 - b. A reference to persons who share a protected characteristic is a reference to persons of the same age group
- 2. A reference to an age group is a reference to a group of persons defined by a reference to age, whether by reference to a particular age or to a range of ages.

Baseline equalities data

4.7 As of 2021, the greatest proportion of residents in the Study Area were in the 25 to 44 age group (37 per cent) (Figure 4.4). This was slightly lower than for the City of London (41 per cent), but higher than for London as a whole (34 per cent). Under 16s constituted 11 per cent of the population, higher than for the City of London (6 per cent), but lower than for Greater London (18 per cent).

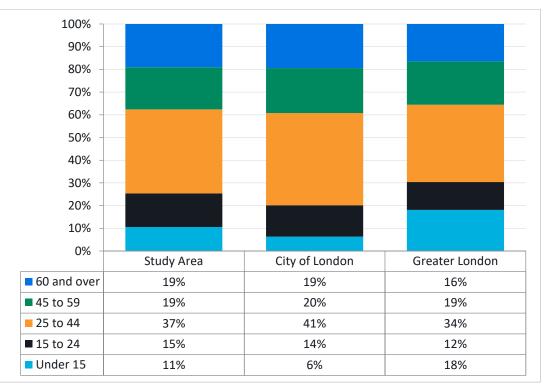


Figure 4.4: Age distribution in the Study Area, compared to City of London and Greater London in 2021.

- 4.8 Figure 4.5 presents LTDS data on how people travel around the City within each age group, and Figure 4.6 presents this same information for London as a whole.
- 4.9 The highest usage of active travel modes (walking and cycling) is among the under 16s (39 per cent), followed by the 25-44 age group (37 per cent). On the other hand, only 29 per cent of 16–24-year-olds walk or cycle. This pattern is consistent with data for Greater London. Public transport is the most popular travel mode in the City, used by over 50 per cent of residents in



Source: Census 2021

each age group. This is higher than the Greater London public transport mode share across all age groups.

4.10 Notably, only 33 per cent of under 16s use public transport in Greater London. In the City, however, this rises to 61 per cent. The use of private vehicles in the City is minimal, making up 4 per cent of all journeys. Over 60s use private vehicles more than any other age group (13 per cent).

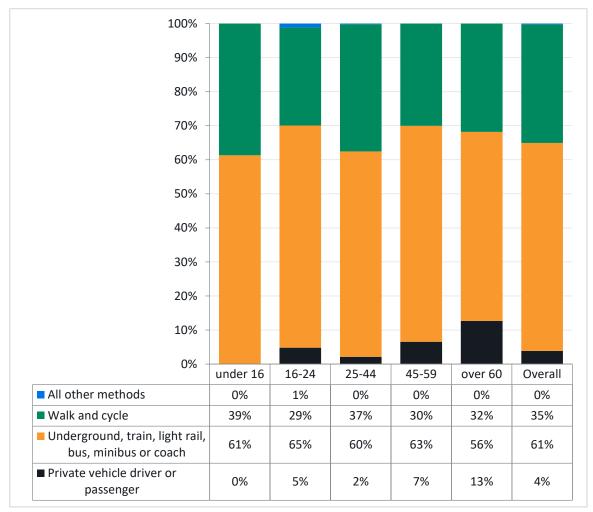


Figure 4.5: Mode share by age in City of London

Source: LTDS average (2017/18, 2018/19, 2019/20)

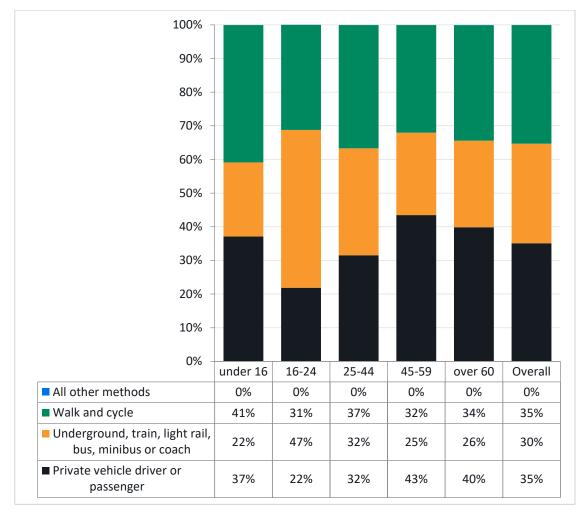


Figure 4.6: Mode share by age in Greater London

Source: LTDS average (2017/18, 2018/19, 2019/20)

Road Safety

- 4.11 Killed and Seriously Injured (KSIs) and Slightly Injured casualties by age category are shown in Figure 4.7 below. In total there were 42 KSIs and 115 Slightly Injured casualties in 2021.
- 4.12 Recorded KSIs are highest for the 16-24 age group (35 per cent) and the 45-59 age group (33 per cent). This indicates that these age groups are disproportionately more likely to suffer more severe consequences if they are a casualty in a collision.
- 4.13 Across the UK, 10-14 age group road accidents make up over 50 per cent of all external causes of death. Moreover, 15–19-year-olds experience almost double the risk of death from road traffic accidents (82.5 deaths per million population) in comparison to the general population.

steer

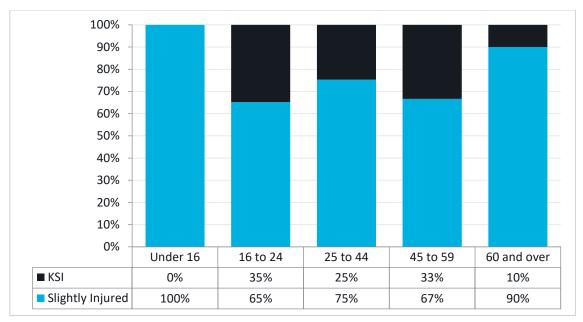


Figure 4.7: Percentage Killed or Seriously Injured by age in City of London (2021)

Source: STATS19, 2021

steer

Page 70

Disability

Definition according to the Equality Act 2010

A person (P) has a disability if:

- a. P has a physical or mental impairment, and
- b. the impairment has a substantial and long-term adverse effect on P's ability to carry out normal day-to-day activities.

Baseline equalities data

4.14 In the Study Area, Census 2021 data shows that 86 per cent of residents feel that they have no physical or mental impairments affecting their daily activities (Figure 4.8). This is notably less than in the City of London and London as a whole. In the Study Area, 9 per cent of residents have their daily activities limited a little, compared 7 per cent in the City and London as a whole; 5 per cent have their activities limited a lot, more than in the City (3 per cent), but less than in London as a whole (6 per cent).



Figure 4.8: Population limited by long-term health problems or disabilities in the study area, City of London and Greater London

Source: Census 2021

4.15 Impairment types stated by those who live in the City of London which affect daily travel are shown in Figure 4.9. Mobility impairment represents the highest proportion (48 per cent), followed by impairment due to serious long-term illness (38 per cent). It should be noted that this data is based on a small sample, therefore results should be taken as a general indication only.

steer

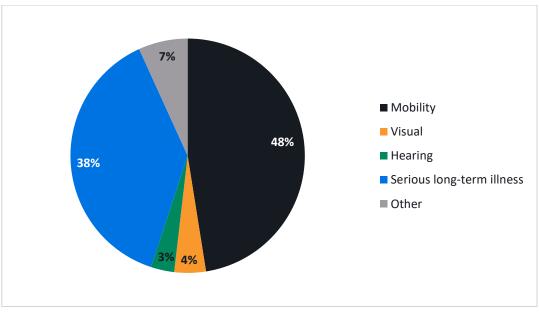


Figure 4.9: Impairment types stated by those with an impairment affecting travel in City of London

Source: LTDS average (2017/18, 2018/19, 2019/20)

- 4.16 The mode share for people with a long-term health problem or disability in the City of London and Greater London is shown in Figure 4.10 and Figure 4.11 respectively. In the City, people with a long-term health problem or disability are more likely to use public transport (63 per cent vs 61 per cent) and more likely to use cars/vans (15 per cent vs 4 per cent) than those without. However, they are less likely to walk or cycle than people without a long-term health problem or disability (22 per cent vs 35 per cent).
- 4.17 This pattern is significantly more pronounced than that for Greater London, where the modal split for people with and without long-term health problems or disabilities is very similar. In contrast to the City, the data for Greater London shows that people with a long-term health problem or disability are less likely to use public transport than those without (27 per cent vs 30 per cent).

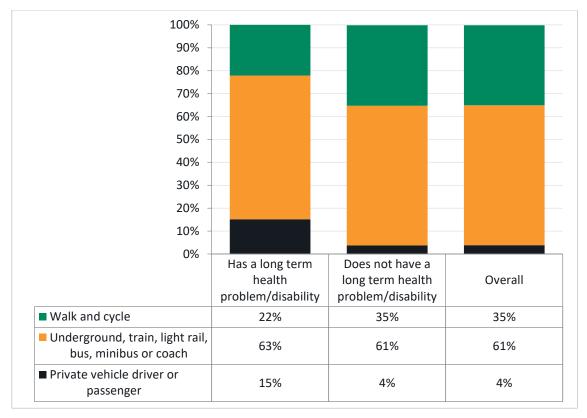


Figure 4.10: Mode share of those with a long-term health problem or disability in City of London

Source: LTDS average (2017/18, 2018/19, 2019/20)

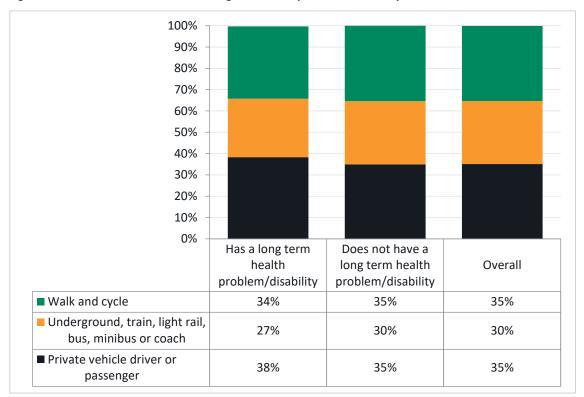


Figure 4.11: Mode share of those with a long-term health problem or disability in Greater London

Source: LTDS average (2017/18, 2018/19, 2019/20)

steer

- 4.18 The mode share for people with specific impairments in City of London and Greater London is shown in Figure 4.12 and Figure 4.13 respectively. Public transport is the dominant mode of travel for people with visual and hearing impairments, serious long-term health conditions and 'other' impairments; it makes up 100 per cent of the mode share for people with visual and hearing impairments, however this must be taken into the context of the small sample size that this data is derived from. The modal split for individuals with mobility impairments is more even, with 38 per cent using public transport, 32 per cent using cars/vans, and 30 per cent undertaking active travel.
- 4.19 Compared to the City, mode share across impairment types for Greater London shows a much greater uptake of active travel and private vehicle use, along with lower public transport mode share. Groups with mobility (46 per cent) and learning (42 per cent) impairments are most likely to use private vehicles, while those with mental health impairments are most likely to undertake active travel (47 per cent).

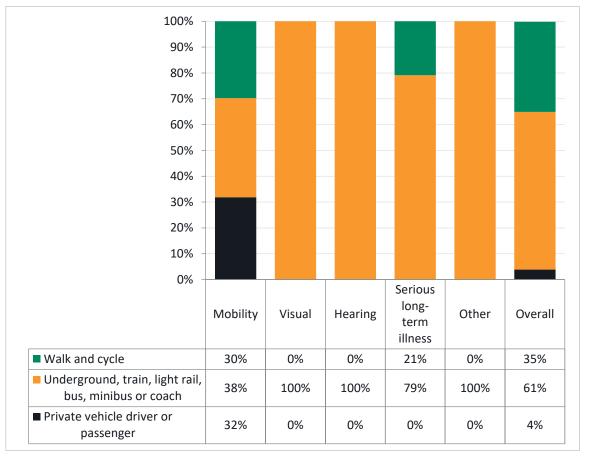


Figure 4.12: Mode share of those with a specific impairment affecting daily travel in City of London

Source: LTDS average (2017/18, 2018/19, 2019/20)

steer

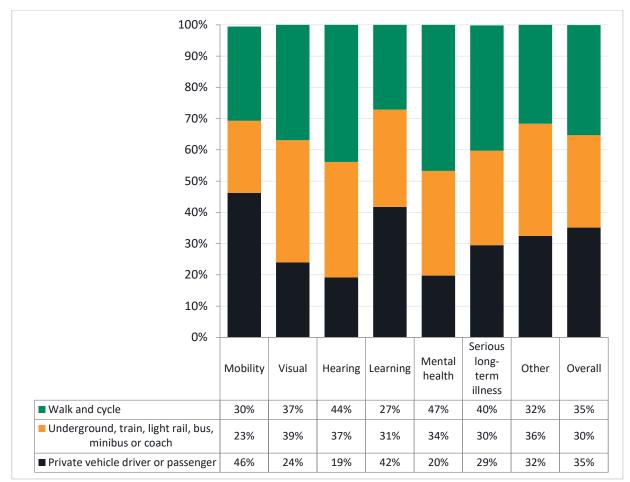


Figure 4.13: Mode split by those with a specific impairment affecting daily travel in Greater London

- 4.20 Focusing on disabled cyclists, the Wheels for Wellbeing annual survey (2019/20)⁴ showed that 65 per cent of disabled cyclists use their cycle as a mobility aid, and 64 per cent found cycling easier than walking. Survey results also show that 31 per cent of disabled cyclists' cycle for work or to commute to work and many found that cycling improves their mental and physical health.
- 4.21 Inaccessible cycle infrastructure was found to be the biggest barrier to cycling, followed by the prohibitive cost of adaptive cycles and the absence of legal recognition of the fact that cycles are mobility aids on par with wheelchairs and mobility scooters. These results are presented on a national level, yet it should be noted that the data is based on a small sample and results should be taken as an indication only.

Source: LTDS average (2017/18, 2018/19, 2019/20)

⁴ WFWB-Annual-Survey-Report-2019-FINAL.pdf (wheelsforwellbeing.org.uk)

Pregnancy and maternity

Definition according to the Equality Act 2010

As per the Equality Act 2010, pregnancy is the condition of being pregnant or expecting a baby, and maternity refers to the period after the birth, and is linked to maternity leave in the employment context. In the non-work context, protection against maternity discrimination is for 26 weeks after giving birth.

Baseline equalities data

- 4.22 In 2021, the General Fertility Rate (GFR) in City of London and Hackney⁵ was 54.1 births per 1,000 women aged 15-44, while the GFR for London was 56 per 1,000 women. This suggests that slightly fewer women of this age group were likely to be pregnant or have given birth in 2021 in the City of London and Hackney, compared to the Greater London average.
- 4.23 Data shows that overall, the number of live births has been gradually falling in City of London and Hackney, and in London as a whole. During this time, the GFR for City of London and Hackney remained consistently below the Greater London average. In 2018, there was a slight increase in the fertility rate in the Borough, before continuing to fall, yet it remained below the Greater London rate (Figure 4.14).

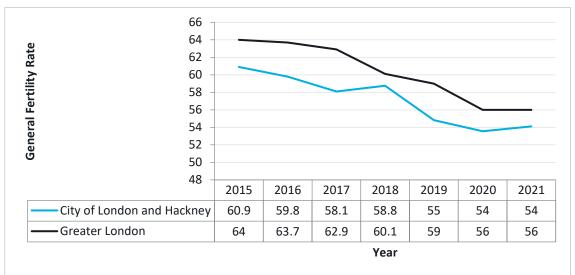


Figure 4.14: General Fertility Rate per year in City of London and Hackney compared to the Greater London average

Source: ONS. Births and Fertility Rates, Borough

⁵ City of London has been grouped with Hackney after 2004 in the dataset: <u>Births and Fertility Rates, Borough -</u> London Datastore

Race

Definition according to the Equality Act 2010

Race includes:

- a. colour;
- b. nationality;
- c. ethnic or national origins.

In relation to the protected characteristic of race -

- d. a reference to a person who has a particular protected characteristic is a reference to a person of a particular racial group;
- e. a reference to persons who share a protected characteristic is a reference to persons of the same racial group.

Baseline equalities data

- 4.24 Figure 4.15 presents the population of the Study Area and City of London by ethnicity. Based on Census 2021 data, 69 per cent of the Borough's population is 'White', making it the most common ethnicity. This is much higher than the Greater London average (54 per cent) and higher than the Study Area (66 per cent). The second most common ethnicity is 'Asian', making up 17 percent and 12 per cent of the residential population in the City and Study Area respectively.
- 4.25 In the Study Area, 8 per cent of the population are 'Black', higher than in the City (3 per cent) but less than in London as a whole (14 per cent). The share of residents that identify as 'Mixed' is similar across the Study Area (6 per cent), City of London (5 per cent) and Greater London (6 per cent).

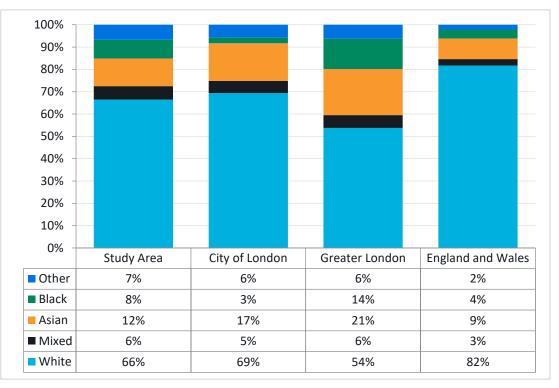


Figure 4.15: Study Area and City of London ethnicity compared to London and national averages

Source: Census 2021



- 4.26 Based on usual travel modes from the LTDS data presented in Figure 4.16, in City of London, 'Mixed or multiple ethnic groups' are most likely to walk and cycle (52 per cent) and least likely to use public transport (48 per cent). Across ethnic groups, car usage is either a very small proportion, at most 4 per cent, or not a part of the mode share.
- 4.27 Overall, in City of London, levels of car use are lower across all ethnicities compared to the London average (Figure 4.17), while levels of public transport use are higher. While 'Asian or Asian British' residents are most likely to use the car in London, this is not the case for City of London, where only 2 per cent say they use the car. 'Black or Black British' residents are most likely (41 per cent) to use public transport in London, and they are second most likely to (82 per cent) in City of London.

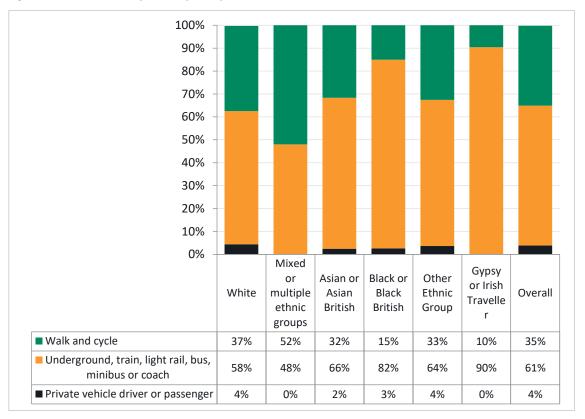


Figure 4.16: Mode share by ethnicity in City of London

Source: LTDS average (2017/18, 2018/19, 2019/20)

steer

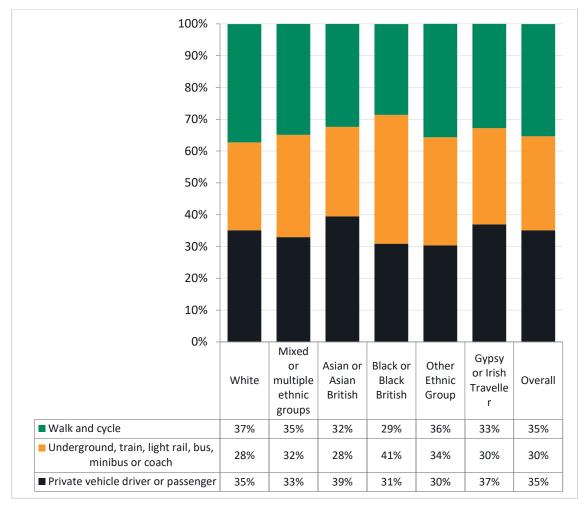


Figure 4.17: Mode share by ethnicity in London

Source: LTDS average (2017/18, 2018/19, 2019/20)

Religion and belief

Definition according to the Equality Act 2010

Religion means any religion and a reference to religion includes a reference to a lack of religion.

Belief means any religious or philosophical belief and a reference to belief includes a reference to a lack of belief.

In relation to the protected characteristic of religion or belief:

- a. a reference to a person who has a particular protected characteristic is a reference to a person of a particular religion or belief;
- b. a reference to persons who share a protected characteristic is a reference to persons who are of the same religion or belief.

Baseline equalities data

- 4.28 Census 2021 data on religion is presented in Figure 4.18. Almost half of the population in the Study Area (42 per cent) and the City (44 per cent) stated that they have 'no religion', compared to only 27 per cent in London as a whole.
- 4.29 Over a third of residents in the Study Area (36 per cent) identified as Christian, compared to 41 per cent in Greater London. Seven per cent of respondents in the Study Area identified as Muslim, compared to 15 per cent in London as a whole.

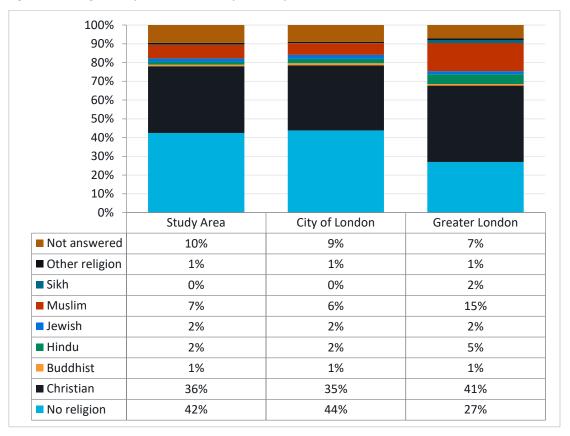


Figure 4.18: Religion composition in the Study Area, City of London, and Greater London

Source: Census 2021

steer

Sex

Definition according to the Equality Act 2010

In relation to the protected characteristic of sex:

- a. a reference to a person who has a particular protected characteristic is a reference to a man or to a woman;
- b. a reference to persons who share a protected characteristic is a reference to persons of the same sex.

Baseline equalities data

4.30 Census 2021 data for population by sex is shown in Figure 4.19. In the study area, a marginally greater proportion of residents identified as male (51 per cent), compared to female (49 per cent). The difference for the City as a whole is more pronounced, with 55 per cent of residents identifying as male, and 45 per cent as female. Greater London shows a more even split, with a slightly higher proportion of females (51 per cent) than males (49 per cent).

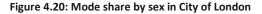


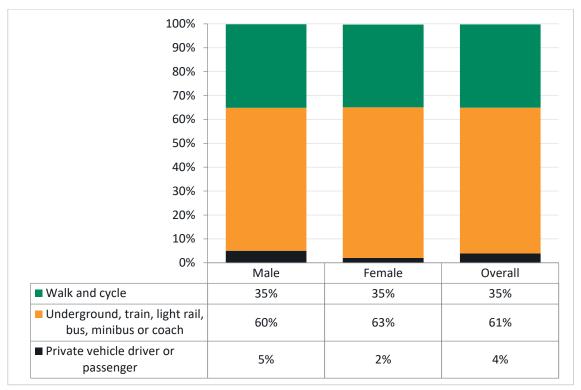


Source: Census 2021

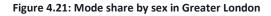
- 4.31 Figure 4.20 presents the mode share by sex in the City of London based on LTDS data. Males are more likely to use a car (5 per cent) than females (2 per cent), however males are less likely to use public transport (60 per cent) than females (63 per cent). The likelihood of using active travel modes, such as walking or cycling are even for both sexes.
- 4.32 Compared to the City of London, overall, both males and females are more likely to use a car and less likely to use public transport in London as a whole (Figure 4.21). The likelihood of walking and cycling is also even for both sexes in London, and in very similar proportions to the City of London.

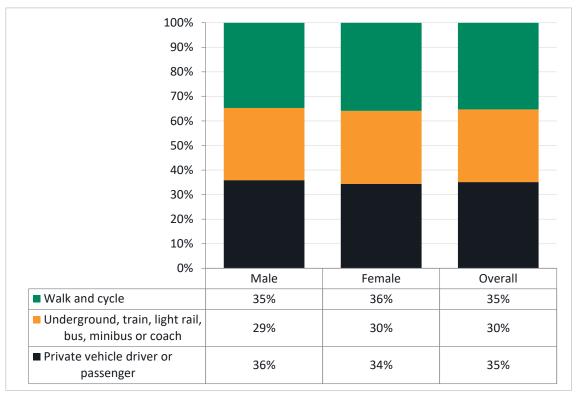
steer





Source: LTDS average (2017/18, 2018/19, 2019/20)





Source: LTDS average (2017/18, 2018/19, 2019/20)

steer

- 4.33 Across Greater London, research undertaken by TfL⁶ shows that females are more likely to use buses than males (62 per cent compared to 56 per cent) but are less likely to use other types of transport including the Tube (38 per cent of females compared to 43 per cent of males).
- 4.34 Female travel needs can be more complex than males due to a range of factors; the increased likelihood of travelling with a buggy and/or shopping affects the travel choices females make, females are also more likely to be carers of children⁷, further affecting the transport choices they make.
- 4.35 Female Londoners make more trips per weekday than male Londoners (2.5 trips compared to 2.3 trips)⁶. This pattern, however, is reversed amongst older adults, with older female Londoners making fewer weekday trips than older male Londoners (2.0 compared to 2.2).
- 4.36 Females aged 17 or over who are living in London are less likely than males to have a full driving licence (58 per cent compared to 72 per cent) or have access to a car (63 per cent compared to 66 per cent). These factors are likely to be related to the frequency of car use as a driver. Almost four in five (79 per cent) females in London report being able to ride a bike, compared to 91 per cent of males.

⁶ Travel in London: Understanding our diverse communities 2019 (tfl.gov.uk)

⁷ National Travel Survey: Travel to School factsheet (publishing.service.gov.uk)

Sexual orientation

Definition according to the Equality Act 2010

Sexual orientation means a person's sexual orientation towards

- a. Persons of the same sex
- b. Persons of the opposite sex, or
- c. Persons of either sex

In relation to the protected characteristic of sexual orientation

- a. A reference to a person who has particular protected characteristics is a reference to a person who is of a particular sexual orientation.
- b. A reference to persons who share a proctored characteristics is a reference to persons who are of the same sexual orientation.

Baseline equalities data

- 4.37 Census 2021 data for sexual orientation is only available at the MSOA level or higher. This is presented in Figure 4.22 below. The MSOA level Study Area has a lower proportion of residents that identify as 'straight or heterosexual' (80 per cent) than London as a whole (86 per cent).
- 4.38 The proportion of those who identify as 'gay or lesbian' is significantly higher in the MSOA level Study Area (6 per cent) than for Greater London (2 per cent), and the proportion of those who identify as 'bisexual' is slightly higher (3 per cent) compared to London as a whole (2 per cent).

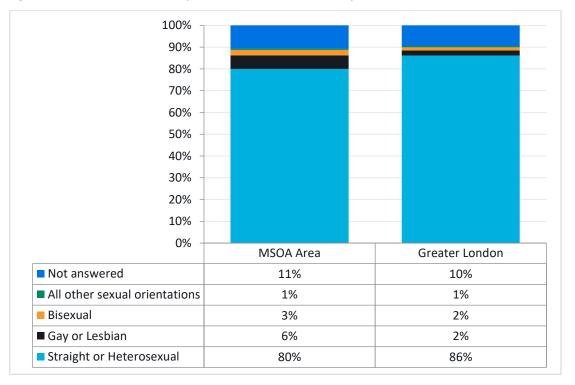


Figure 4.22: Sexual orientation composition for the MSOA level Study Area and Greater London

Source: Census 2021



- 4.39 According to TfL's 'Travel in London: Understanding our diverse communities' study (2019)⁸, Londoners who identify themselves as being LGB (lesbian, gay and bisexual) account for 2.6 per cent of the city's population. It found that LGB people have a similar profile to the general population when asked about barriers to using public transport.
- 4.40 Over half (52 per cent) of LGB respondents cited overcrowding as an issue, compared to 48 per cent of the general population. 41 per cent of both LGB respondents and the general population identified the cost of travel as an issue. 30 per cent of LGB respondents saw passengers pushing and shoving each other on public transport as a key issue, while 26 per cent of the general population raised this as a concern. Overall, it was found that fears about abuse and/or intimidation can have a greater effect on the travel behaviours of LGB Londoners.

⁸ Travel in London: Understanding our diverse communities 2019 (tfl.gov.uk)

Gender reassignment

Definition according to the Equality Act 2010

A person has the protected characteristic of gender reassignment if the person is proposing to undergo, is undergoing or has undergone a process (or part of a process) for the purpose of reassigning the person's sex by changing physiological or other attributes of sex.

A reference to a transsexual person is a reference to a person who has the protected characteristic of gender reassignment.

In relation to the protected characteristic of gender reassignment

- a. A reference to a person who has a particular protected characteristic is a reference to a transsexual person;
- b. A reference to persons who share a protected characteristic is a reference to transsexual persons.

Baseline equalities data

4.41 Census 2021 data for gender reassignment is only available at the MSOA level or higher. This is presented in Figure 4.23 below. The MSOA level Study Area has a marginally lower proportion of residents whose gender identity is the same as sex registered at birth (90.8 per cent) compared to London as a whole (91.2 per cent). The proportion of those who identify as 'trans woman' is higher in the MSOA level Study Area (0.4 per cent) than in Greater London (0.2 per cent).

100%		
90% -		
80%		
70% -		
60% -	-	
50% -	-	
40% -		
30% -		
20% -	-	
10% -		
0% —	MSOA Area	Greater London
Not answered	8.2%	7.9%
All other gender identities	0.2%	0.1%
Trans man	0.1%	0.2%
Trans woman	0.4%	0.2%
Gender identity different from sex registered at birth but no specific identity given	0.2%	0.5%
Gender identity the same as sex registered at birth	90.8%	91.2%

Figure 4.23: Gender composition of the MSOA-level Study Area and Greater London

Source: Census 2021



4.42 According to TransActual UK, for those travelling by public transport, 68 per cent of trans women, 63 per cent of non-binary people, and 60 per cent of trans men have experienced transphobia on public transport⁹. Research also shows that LGBTQ+ individuals are likely to encounter higher levels of unsolicited sexual behaviour and harassment on public transport and are more likely to take travel options that are perceived as 'safer', sometimes at the expense of longer journey times or higher travel costs¹⁰.

⁹ Press release: Trans Lives Survey 2021 — TransActual

¹⁰ <u>Full article: Queer mobilities: critical LGBTQ perspectives of public transport spaces (tandfonline.com)</u>

5 Impact Assessment

5.1 Table 5.1 summarises the potential positive and negative impacts of the scheme and the protected characteristics that are disproportionately impacted. These are assessed in further detail in this chapter.

Table 5.1: Protected characteristics impacted

Potential impact	Protected characteristic impacted
Positive	
Road safety improvements	 Age Disability Pregnancy and maternity Race Religion or belief
Air quality improvements	AgeDisabilityPregnancy and maternity
Improved waiting environment at bus stop BN	 Age Disability Race Sex
Negative	
Increased journey times for non- compliant motor vehicles	 Age Disability Pregnancy and maternity Religion or belief
Reduction in the availability of taxis	AgeDisability
Reduced access to adjacent residential streets	 Age Disability Race Sex
Perception of personal safety	 Disability Race Sex Sexual orientation Gender reassignment

 Disability Pregnancy and maternity 	Worsening of Golden Lane air quality	AgeDisabilityPregnancy and maternity
---	--------------------------------------	--

Potential disproportionately positive impacts

Road safety improvements

5.2 The restrictions to motor traffic on Beech Street would result in reduced volumes of motor traffic. On Golden Lane, there could also be a reduction in motor traffic volumes due to the restriction from turning into Golden Lane from Beech Street. Reduced motor traffic creates a safer and more pleasant environment for walking and cycling.

Protected characteristics impacted

- Age
- Disability
- Pregnancy and maternity
- Race
- Religion or belief

Summary of potential impacts

- 5.3 Younger people, specifically those in the under 16 and 25-44 age categories, will benefit from improvements to the pedestrian environment the most, as they have the highest walking and cycling mode share (39 per cent and 37 per cent respectively) in City of London.
- 5.4 Reduced volumes in motor traffic will make it easier to find a gap in traffic to cross the road. This may disproportionately benefit some disabled people who may take longer to cross the road due to mobility impairments. Data on mode share by impairment type shows that nearly a third (30 per cent) of disabled people in the City with a mobility impairment walk or cycle.
- 5.5 Reductions in motor traffic are likely to reduce conflict between different road users overall. This will create a safer environment, particularly for pregnant people as they may have reduced mobility and thus require longer times to cross the road. This will also provide benefits to pedestrians travelling with prams who may require additional time to navigate kerbs when crossing the street.
- 5.6 Improvements to road safety will disproportionately benefit racial or ethnic groups who are more likely to walk or cycle in the City of London (52 per cent of people identifying as 'Mixed or multiple ethnic groups'), as well as those who are more likely to use public transport (as every public transport journey starts or ends on foot or cycle).

Air quality improvements

5.7 Air quality modelling forecasts a reduction of NO₂ on Beech Street (at the air quality monitor western end) from 39.4 μg/m³ to 30.4 μg/m³ and reduction of NO₂ on Beech Street between Golden Lane and the eastern entrance to Beech Street from 38.8 μg/m³ to 31 μg/m³. The forecast reduction in emissions would improve the quality of air on Beech Street.

Protected characteristics impacted

- Age
- Disability
- Pregnancy and maternity



Summary of potential impacts

- 5.8 Both young and old age groups are disproportionately vulnerable to poor air quality and pollution. For the elderly, exposure to high levels of air pollution can lead to a range of long-term health problems, while young children may suffer from reduced lung development. Therefore, a reduction in emissions from non-zero emission vehicles is likely to benefit these age groups through cleaner air.
- 5.9 The air quality improvements may disproportionately benefit disabled people who are particularly vulnerable to air pollution and/or those reporting stamina or breathing impairments.
- 5.10 Improvements in air quality are likely to disproportionately benefit pregnant women. Polluted air is harmful for babies in the womb and can cause premature birth or low birth weight both factors are associated with higher infant mortality. Furthermore, new-born babies, babies in prams and children are more vulnerable to breathing in polluted air than adults due to their airways being in development, and their breathing being more rapid than adults.

Improved waiting environment at bus stop BN

5.11 Reduced volumes of motor traffic will result in a reduction in noise and air pollution, creating a more pleasant environment for bus passengers using bus stop BN on Beech Street.

Protected characteristics impacted

- Age
- Disability
- Race
- Sex

Summary

- 5.12 The 16-24 age category is most likely to use public transport (65 per cent) in the City and will therefore disproportionately benefit from any improvements to bus facilities, including those that arise because of reduced motor traffic and congestion.
- 5.13 82 per cent of 'Black or Black British' residents in the City are most likely to use public transport as their mode of travel, so will disproportionately benefit from the improved environment. 8 per cent of the Study Area population are 'Black', which is higher than in the City of London.
- 5.14 The reduction in noise pollution may have benefits for some disabled people, such as those who experience hypersensitivity. In the City, those with hearing and 'other' impairments solely use public transport as their mode of travel, so they might disproportionately benefit from reduced noise pollution.
- 5.15 An improved waiting environment may disproportionately benefit females, who are more likely to use public transport in the City of London (63 per cent) compared to males (60 per cent).

Potential mitigation measures

5.16 At present, there are no seating facilities at the bus stop on Beech Street, meaning that people are required to stand during their wait for the bus to arrive. The benefits of this scheme could be extended through working with TfL to improve the passenger waiting area. This would

create a more pleasant experience for all passengers and may disproportionately benefit those with physical impairments which make it difficult to stand for longer periods.

Potential disproportionately negative impacts

Increased journey times for non-compliant motor traffic

5.17 Re-routing of non-compliant motor traffic to avoid Beech Street may cause increased journey times for those reliant on private cars.

Protected characteristics impacted

- Age
- Disability
- Pregnancy and maternity
- Religion or belief

Summary of potential impacts

- 5.18 Re-routed journeys may lead to longer journey times for people who rely on private vehicles. This may have a disproportionately negative impact on older people who are more likely to rely on the car for essential trips such as medical appointments and grocery shopping. These impacts can also affect any family members, friends or personal assistants / support workers that may support them in driving them in their private car. Data on mode share by age category shows that over-60s have the highest mode share of private vehicle driver or passenger (13 per cent) in the City.
- 5.19 Similarly, elderly people rely disproportionately on taxis or Dial-a-Ride services. Potential increases in journey times or displaced motor traffic congestion may lead to longer journey times which may be inconvenient or uncomfortable.
- 5.20 The traffic restrictions have the potential to negatively impact journey times for those with mobility impairments who may find it more difficult to walk or cycle, and therefore need to make use of door-to-door transport services such as private cars or taxis. Increased journey times may lead to further discomfort and anxiety for some disabled people, and ultimately may have a detrimental impact on their mental or physical health.
- 5.21 Pregnant people may find walking and cycling difficult due to the physical exertion when pregnant. These people may therefore have a heightened need for door- to-door transport such as private cars or taxis. The traffic restrictions may disproportionately negatively impact pregnant people and parents travelling with infants who are more reliant on door-to-door transport.
- 5.22 Journey times may increase for some worshippers who drive to local places of worship (i.e., Capeli Cymraeg Llundain, London Welsh Chapel). For those unable to take an alternative method of transport, that may cause a disproportionately negative impact.

Potential mitigation measures

- It is recommended that the City proactively engage with places of worship to notify them of the proposed changes. The places of worship can disseminate information about the proposed scheme to their worshippers and how this might impact their journeys.
- It is recommended that the City explores the feasibility and practicality of exempting Blue Badge holders and personal assistants / support workers from the traffic restrictions. This would assist in mitigating the potentially negative impacts to disabled people and their personal assistants / support workers.

steer

Reduction in taxi availability

5.23 Taxi drivers who do not have an electric vehicle might be deterred from plying for hire on Beech Street and the surrounding area due to the traffic restrictions. This might lead to a general reduction in taxi presence in the area, affecting those reliant on taxis.

Protected characteristics impacted

- Age
- Disability

Summary of potential impacts

- 5.24 Elderly people rely disproportionately on taxis compared to other age groups within the City, therefore, might be negatively affected by any reduction in the availability of taxis. This might result in elderly people being less able to access local places, as they need to use door-to-door transport.
- 5.25 Those with mobility impairments who may find it more difficult to walk or cycle, and therefore need to make use of door-to-door transport services such as private cars or taxis, might also be disproportionately negatively affected.

Potential mitigation measures

 It is recommended that the City undertake a survey to collect data on taxi circulation within the area to better understand the availability of taxis within and around Beech Street, and the associated impact this may have on people who rely upon them as an essential mobility aid.

Reduced access to adjacent residential streets

5.26 Friends, family, and helpers of elderly and/or disabled people might be restricted from dropping them off or visiting them on adjacent residential streets e.g., Brackley Street, Bridgewater Street, Viscount Street and Fann Street, if they are driving a non-compliant vehicle.

Protected characteristics impacted

- Age
- Disability
- Race
- Sex

Summary of potential impacts

5.27 Disabled people are more likely than non-disabled people to rely upon family members or friends for daily care, with many disabilities requiring support for Activities of Daily Living. The traffic restrictions may create additional difficulties and costs for personal assistants / support workers in a non-compliant vehicle, who are required to travel via Beech Street to provide care. This may lead to personal assistants / support workers being unable to attend as regularly or incur costs which could impact their quality of life.

steer

- 5.28 In 2021, 18.5 per cent of black workers were in 'caring, leisure and other services' jobs, which is the highest percentage out of all ethnic groups¹¹, therefore those who identify as 'Black' might be disproportionately negatively affected.
- 5.29 Women are more likely to become personal assistants / support workers than men and data from the 2021 Census shows that 59 per cent of unpaid personal assistants / support workers are women¹². They might be disproportionately negatively affected by the reduced access to adjacent residential streets.

Potential mitigation measures

• It is recommended that the City explore the practicality and feasibility of exempting personal assistants / support workers from the traffic restrictions. This would assist in mitigating the potentially negative impacts to elderly and disabled people, and their family, friends, and helpers.

Perception of personal safety

5.30 Reduced volumes of motor vehicle traffic will create a quieter environment. For some people, this has been reported to heighten the apprehension of personal threat, particularly as the street is an enclosed space (within a tunnel).

Protected characteristics impacted

- Disability
- Race
- Sex
- Sexual orientation
- Gender reassignment

Summary of potential impacts

- 5.31 Disabled adults often feel less safe than non-disabled adults walking alone in a quiet street close to home and using public transport on their own¹³. Of those in the City who have a longterm health problem / disability, 22 per cent walk or cycle so they will be disproportionately negatively affected. Furthermore, traffic restrictions allowing zero-emission vehicles only can negatively impact those with visual impairments. Blind and partially sighted people may not be able to hear quiet electric and hybrid vehicles approaching. However, the Department for Transport has prohibited the pause function on sound generators in all new electric vehicles from September 2023¹⁴ so the severity of this impact will reduce in time.
- 5.32 The significantly quieter environment can heighten fear for people within the LGBTQIA+ and BAME communities where hate crime is a particular concern¹⁵. The perception may also be felt particularly by certain women making trips by foot or bicycle, as part of a public transport

¹¹ Employment by occupation - GOV.UK Ethnicity facts and figures (ethnicity-facts-figures.service.gov.uk)

¹² Key facts and figures | Carers UK

¹³ Perceptions of personal safety and experiences of harassment, Great Britain - Office for National Statistics

¹⁴ Electric vehicles: Department for Transport clarifies rule on sound generators | RNIB

¹⁵ Travel in London: Understanding our diverse communities 2019 (tfl.gov.uk)

journey or a trip on its own. This, however, can be balanced by increases in people walking and cycling which in turn can improve the overall sense of safety for these people.

Potential mitigation measures

- It is recommended that the City engages with the City of London Police to monitor crime and anti-social behaviour across the City of London, particularly on Beech Street and adjacent streets (Bridgewater Street, Brackley Street, Viscount Street and Fann Street). Furthermore, to deter crime and anti-social behaviour patrols could be increased throughout the area during quieter time periods, e.g., evenings.
- It is recommended that the City engages with residents about the proposals and potential complementary public realm improvements that could be made. This would provide the City with insight into the possible impact of plans can be gained before the scheme is made permanent.
- It is recommended that the City explores the potential to make public realm improvements within Beech Street, primarily to improve the lighting and reduce the number of 'blind' corners. This would assist with improving the look and feel of the street, as well as the perception of personal safety¹⁶.

Worsening of Golden Lane air quality

5.33 Air quality on Golden Lane might not necessarily improve as motorised traffic exiting Golden Lane is not restricted. Air quality modelling indicates there is likely to be marginal increase in NO₂ on Golden Lane from 29.4 μ g/m³ to 30 μ g/m³.

Protected characteristics impacted

- Age
- Disability
- Pregnancy and maternity

Summary

- 5.34 The marginal increases in air quality on Golden Lane could disproportionately negatively impact those most susceptible to air pollution, including young children, older people and/or those reporting stamina or breathing impairments.
- 5.35 Worsened air quality would also disproportionately negatively impact pregnant women. Polluted air is harmful for babies in the womb and can cause premature birth or low birth weight - both factors are associated with higher infant mortality¹⁷. Furthermore, new-born babies, babies in prams and children are more vulnerable to breathing in polluted air than adults due to their airways being in development, and their breathing being more rapid than adults.

Potential mitigation measures

• It is recommended that the City monitor actual air quality on Golden Lane postimplementation and periodically report on the findings. If air quality decreases, or there is

¹⁶ Pedestrian safety perception and urban street settings: International Journal of Sustainable Transportation: Vol 14, No 11 (tandfonline.com) and Impact of public lighting on pedestrians' perception of safety and well-being - ScienceDirect

¹⁷ State of Global Air: Impact on Newborns <u>https://www.stateofglobalair.org/health/newborns</u>

a worse outcome than the modelling indicates, the City should explore alternative measures to mitigate increases in pollution on Golden Lane.

steer

Page 95

6 Summary of recommended mitigating actions

- 6.1 Table 6.1 (overleaf) presents an action plan for each of the mitigating actions identified within this EqIA.
- 6.2 For each action, an action owner has been identified who will be responsible for ensuring that the action is progressed. Furthermore, timescales are outlined to assist with monitoring of this document.
- 6.3 To ensure transparency of the design and decision-making process, it is recommended that an update on the status of each recommended mitigating action is included within a future addendum to this EqIA.

Table 6.1: Action Plan

Issue identified	Protected characteristic impacted	Action required/comments	Action owner	Timescale
Increased journey times for non- compliant motor vehicles	 Age Disability Pregnancy and maternity Religion or belief 	 Engage with places of worship to notify them of the proposed changes. They can disseminate information about the proposed scheme to their worshippers and how this might impact journeys. Explore the feasibility and practicality of exempting Blue Badge holders and personal assistants / support workers from the traffic restrictions. 	Project Manager	Pre- implementation
Reduction in taxi availability	AgeDisability	• Undertake a survey to collect data on taxi circulation within the area.	Project Manager	Pre- implementation
Reduced access to adjacent residential streets	 Age Disability Race Sex 	• Explore the practicality and feasibility of exempting personal assistants / support workers from the traffic restrictions.	Project Manager	Pre- implementation
Perception of personal safety	 Disability Race Sex Sexual orientation Gender reassignment 	 Engage with the City of London Police to monitor crime and anti-social behaviour, particularly on Beech Street and adjacent streets. If necessary, anti-social behaviour patrols could be increased throughout the area during quieter time periods, e.g., evenings. Engage with residents about the proposals and potential complementary public realm improvements. Explore the potential to make public realm improvements within Beech Street, primarily to improve the lighting and reduce the number of 'blind' corners. 	Project Manager	During implementation Pre- implementation
Waiting environment at bus stop BN	 Age Disability Race Sex 	Work with TfL to improve the passenger waiting area at the bus stop.	Project Manager	Pre- implementation

Worsening of Golden	AgeDisability	 Monitor actual air quality on Golden Lane post-implementation and periodically report on the findings. 	Project Manager	During implementation
Lane air quality	 Pregnancy and maternity 	 If air quality increases or there is a worse outcome than the modelling indicates, the City should explore alternative measures to mitigate for increases in pollution on Golden Lane. 		Post- implementation

Control Information

Prepared for	
City of London Corporation Guildhall London EC2P 2EJ	
Client contract/project number	
Reviewer/approver	
JDY	
Distribution	
Client: Kristian Turner Steer:	
Date	
16 th June 2023	



steer

Page 99



steergroup.com

Beech Street Consultation Consultation Findings Draft Report



SYSTIA

May 2023



Page 1 **Beech Street** SYSTIA 02 **Consultation Findings** In 2020, The City of London Corporation ("The City") ran an 18-month traffic experiment on Beech Street to reduce NO, levels. The experiment restricted polluting traffic from using Beech Street as a "through route" CITY 24hrs a day. Unrestricted access was allowed for zero-emission capable vehicles and for any vehicle accessing LONDON properties and car parks on Beech Street. Following this experiment, the City have developed a new proposed permanent scheme for Beech Street, working with Islington Council. This report presents the findings of a consultation on the new proposed changes to the Beech Street Zero Emissions Scheme. The consultation 49% was live between 14th January 2023 - 6th March 2023, and a total of 827 responses were received. thought the scheme does not go far enough to 41% address traffic thought the levels scheme does not go far enough to address air quality 34% did 49% 51% not support any T traffic restriction on Beech Street 35% did not support 27% keeping Golden Lane open to all had access vehicles concerns Support Oppose Over 100% a third travelled by foot around reported living or working the Beech Street area in the City of London Islington City residents Cycle Rail or Walk Bus Toxi or private Car Taxi or private Motorcycle underground hire vehicle passenger



- o Introduction
- o Respondent profile
- o Travel Behaviour
- Proposals for Beech Street
- Support for proposals
- Reasons for not supporting the proposals
- o Email response feedback
- Conclusions







Introduction

Background to the consultation

The City of London Corporation ("The City") is working to enhance the air quality on Beech Street, one of the worst-polluted streets in the City of London with nitrogen dioxide (NO₂) levels often much higher than the maximum levels recommended by the World Health Organisation.

In 2020, the City ran an 18-month traffic experiment on Beech Street to reduce NO₂ levels. The experiment restricted polluting traffic from using Beech Street as a "through route" 24hrs a day. Unrestricted access was allowed for zero-emission capable vehicles and for any vehicle accessing properties and car parks on Beech Street.

When the experimental scheme finished in September 2021, the traffic restrictions were removed. Since then, traffic has returned and is now at 85% of previous traffic levels. As a result, air quality has worsened, and the level of NO₂ is again near legal limits. If traffic were to continue to increase, it is anticipated that it will again be above legal limits.

The City have now developed a new proposed scheme for Beech Street, working with Islington Council.

The City commissioned **SYSTRA** to design, host, analyse and report on a consultation survey assessing the level of support for making the new proposed changes to the Beech Street Zero Emissions Scheme permanent.

This report outlines the findings of this consultation survey which ran between 14th January 2023– 6th March 2023, and received 789 responses.

In addition to responses being received via the consultation survey, a total of 38 free-form responses were provided via email. Email responses have been summarised in Chapter 7 of this report.

The findings from this consultation will be used by the City to inform the decision on whether to make the Beech Street Zero Emissions Scheme permanent.



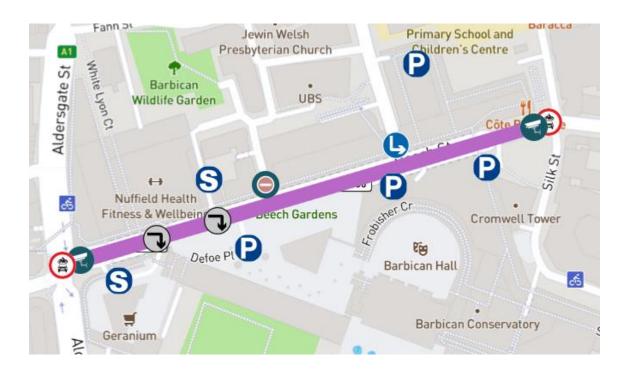
Introduction The consultation survey

The consultation survey was primarily delivered using **PlaceChangers**, an interactive online map-based consultation tool. An interactive map showed the different elements of the new proposed scheme for Beech Street and used 'guided tour' functionality to encourage respondents to navigate between the different elements.

At the end of the guided tour, respondents were provided with the option to leave **feedback** on the street by completing a short online survey that captured:

- Demographic questions;
- Usual travel along the street;
- Level of support for making changes permanent; and
- An opportunity to provide feedback on why they did not support the scheme, if applicable.

A total of 787 responses were provided via the online consultation tool. In addition, 2 responses were provided using paper versions of the survey form. Both online and paper survey responses have been analysed together.



Introduction

Analysis and Reporting approach

All survey data was cleaned and analysed using statistical analysis software, SPSS. All **closed questions** within the consultation survey were tabulated and chi-square statistical tests were run to assess whether there were variations in survey answers between different groups of respondents. This report highlights where statistically significant differences between different groups of respondent have been found.

The consultation survey included one **open text** question:

• If you have other reasons for why you do not support the scheme, please provide details in the free text box below.

Each response provided to this question was read and analysed in detail, with each sentiment allocated to a code. These codes (and their relationships) are known as the 'coding framework'. Coding ensures all ideas and points raised by respondents to the open-ended questions are captured and reported on. Responses to the open text question are reported in Chapter 6 of this report. Anonymised verbatim quotes are used to illustrate the points made.

The 38 free-form responses provided via email were also analysed using a coding approach. As the free-form email responses cannot be matched up to questions within the survey, these responses were analysed and reported on separately for the purposes of this report. Detail on email responses can be found in Chapter 7. Anonymised verbatim quotes are used to illustrate the points made.

As with all analysis of consultation data, it should be noted that:

- The sample of respondents is self-selecting and therefore the findings do not aim to be representative of the City population or road user groups;
- The base sizes for each question vary, as not all questions were compulsory to answer;
- The consultation survey included some multiple response questions (MRQ), for which participants could select more than one response. These are signified through use of 'MRQ' in relevant figure headings;
- The views and opinions reported are the views and perceptions of respondents and are not necessarily factually correct;
- The consultation process cannot be seen as a 'vote' and we do not attempt to draw conclusions, based on the number of people offering positive or negative comments toward the schemes; and
- The open text data provided by respondents was self-selecting, meaning respondents could choose whether or not to provide a more detailed comment. Whilst this approach ensures the views and opinions of different types of people are heard, the detail provided cannot be taken to be representative of the respondent sample, the City population or road user groups.

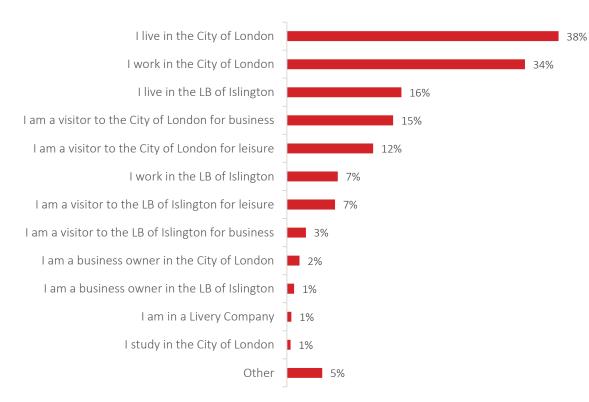




Overall Survey Sample

Relationship to the Beech Street area

Two in five respondents (38%) to the consultation survey reported living within the City of London, and just over a third (34%) reported working within the City of London. This compares to 16% who reported living in Islington, and 7% who reported working in Islington.



What is your relationship to the Beech Street area? (MRQ; Base: 782)

* Note, not all respondents to the online consultation survey chose to answer this question. Respondents could also provide more than one answer so the percentages do not add up to 100%

Page 109

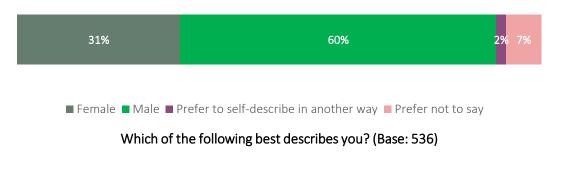
Survey Respondent Demographics Age Gender

Almost a quarter of respondents fell within the 45 to 54 age category (24%), and a similar number (23%) fell within the 35 to 44 age category.

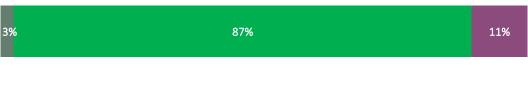
1% 							
3%	17%	23%	24%	15%	8%	5%	4%
	. (Jnder 18	18 to 24	25 to 34			
		35 to 44 55 to 74		55 to 64 Prefer not to s	ау		

Which of the following age groups do you fall within? (Base: 543)

A large proportion of respondents identified as male (60%), compared to just under a third (31%) who identified as female and 2% who identified in another way.



The majority of respondents (87%) reported that their gender does not differ from that assigned at birth.



■ Yes ■ No ■ Prefer not to say

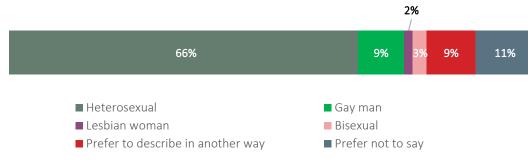
Does your gender differ from that assigned at birth? (Base: 518)

SYSTIA

* Note, not all respondents to the consultation survey chose to answer these questions

Sexuality Ethnicity

Two thirds of respondents identified as heterosexual (66%), while just under a tenth (9%) identified as gay men, 2% as lesbian women, and 3% as bisexual.



Please select the sexual orientation that best describes you. (Base: 500)

Maternity

The majority of respondents reported not having had a baby in the last 12 months (88%).



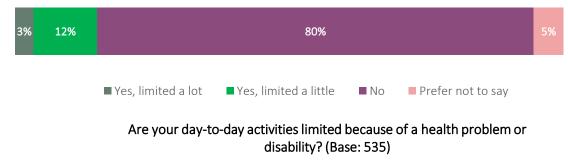
Nearly three quarters of respondents identified as White or Caucasian (72%), 7% as multiple ethnic groups, 5% as Asian and 4% as other/unknown.

72%	2 <mark>%</mark> 5% 7% <mark>4% 11%</mark>
 White or Caucasian Asian Other ethnic group or unknown 	 Black Multiple ethnic groups Prefer not to say

Please select the ethnic group that best describes you. (Base: 501)

Disability

15% of respondents reported having a health problem or disability that limits their day-to-day activities.



SYSTIA

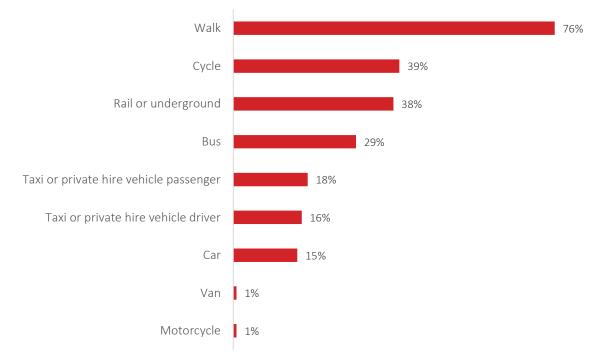
* Note, not all respondents to the consultation survey chose to answer these questions





How do people travel around the Beech Street area? Normal mode of travel

Those responding to the consultation survey were asked about their usual mode of travel when travelling around the Beech Street area. **Travelling by foot** was the most common, reported by three quarters of respondents (76%), followed by two fifths who reported cycling (39%), or using rail or underground services in the area (38%).



How do you normally travel around the area? (MRQ; Base: 775)

* Note, not all respondents to the online consultation survey chose to answer this question. Respondents could also provide more than one answer so the percentages do not add up to 100%



4 Proposals for Beech Street



What information did the consultation provide on the Beech Street Zero Emissions Scheme?

Travelling on Beech Street

The changes to travelling on Beech Street would be:

- Only zero-emission capable vehicles would be able to drive through Beech Street without stopping. In most cases a zero-emission capable
 vehicle is fully electric and not a hybrid. Vehicle criteria can be checked at: <u>https://www.vehicleenquiry.service.gov.uk/</u>
- All other vehicles (including deliveries, taxis and visitors) would be able to enter Beech Street if accessing a car park and forecourts.
- The car parks at Cromwell Tower (Ground Floor), Shakespeare Tower and Defoe House would be accessed by all vehicles in both directions as the central reservation gap will be retained.
- The servicing and delivery area at Lauderdale Place would be accessed by all vehicles in both directions as the central reservation gap will be retained.
- The Barbican Trade Centre would only be accessed from the Aldersgate Street end of Beech Street.
- Barbican Centre car parks would only be accessed from the east via Chiswell Street or Silk Street.
- The car parks at Breton House and Ben Johnson House would only be

accessed from Beech Street by zero-emission capable vehicles travelling from the Aldersgate Street end of Beech Street.

Maps showing permitted movements can be seen the Beech Street Website: <u>https://www.cityoflondon.gov.uk/services/streets/traffic-</u><u>schemes-and-proposals/beech-street</u>



SYSTIA

What information did the consultation provide on the Beech Street Zero Emissions Scheme?

Junctions on Beech Street

The changes to the Golden Lane junction on Beech Street would be:

- Golden Lane junction would remain open to all vehicles travelling down Golden Lane into Beech Street. Only zero-emission capable vehicles travelling from Aldersgate Street could turn into Golden Lane from Beech Street.
- Prior to the experiment 3,300 motor vehicles a day travelled on Golden Lane. Today there are approximately 1,800 motor vehicles a day. It is estimated that opening the junction to all vehicles will increase motor vehicle traffic to 3,000 vehicles a day.
- Fortune Street would not have any additional traffic restrictions.

The **changes to the Bridgewater Street junction** with Beech Street would be:

• The Bridgewater Street junction with Beech Street would be closed to all vehicles except people cycling.





SYSTIP

Page 117

What information did the consultation provide on the Beech Street Zero Emissions Scheme?

Signage and Enforcement

The proposed **signs** would stop Beech Street being used as a "through" route for polluting vehicles, but would still allow access to car parks and properties. This includes access for deliveries and pick up and drop off by taxis and private hire vehicles.

Vehicle movements would be **enforced** by Automatic Number Plate Recognition (ANPR). ANPR cameras would enforce the Beech Street restriction as follows:

- Non-zero emission capable vehicles driving through Beech Street without stopping would receive a Penalty Charge Notice
- Polluting vehicles accessing a property or car park on Beech Street would not receive a Penalty Charge Notice
- Zero-emission capable vehicles driving through Beech Street would not receive a Penalty Charge Notice











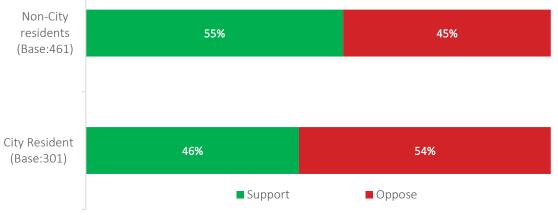
Is there support for making the changes permanent?

After being provided with detail on the proposals for the Beech Street Zero Emissions Scheme (as outlined in Chapter 4), respondents to the consultation survey were asked whether or not they supported the proposals presented.

Support was divided, with half of respondents stating support for the proposals as presented (51%) and half stating opposition (49%).

51%

Level of support varied significantly by area of residence. Specifically, those who live in the City were significantly more likely to oppose the proposals, as presented, than those who do not live in the City (54% compared with 45%). Level of support did not differ between Islington and non-Islington residents.

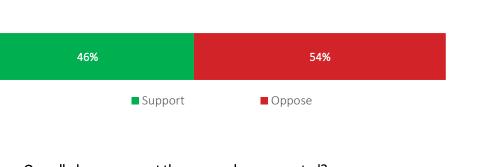


Overall, do you support the proposals as presented? (Base: 789)

Support Oppose

49%

Overall, do you support the proposals as presented?

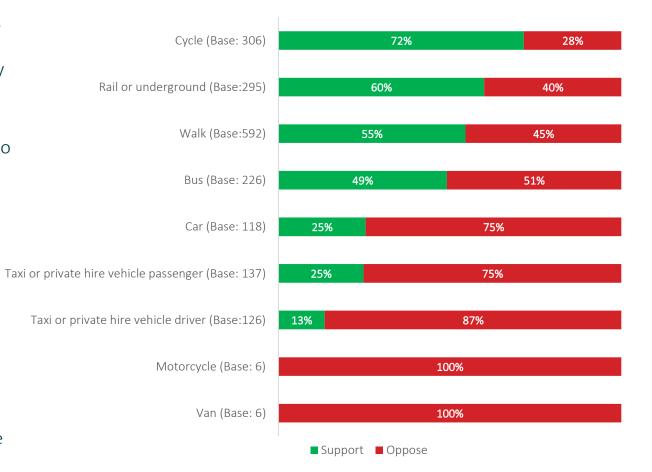


Is there support for making the changes permanent?

Support for the proposals was highest from people who cycle in the Beech Street area (72%), followed by those who travel by rail or underground (60%), those who walk (55%), and those who travel by bus (49%). Opposition was highest from those who reported travelling by private vehicle or taxi or private hire vehicle.

Level of support varied significantly by usual type of transport used to travel in the Beech Street area.

- People who walked were more likely to **support** the proposals than those who did not walk;
- People who cycled were more likely to **support** the proposals than those who did not cycle;
- People who travelled by rail or underground were more likely to **support** the proposals than those who did not travel by rail or underground;
- Taxi drivers were more likely to **oppose** the proposals than non-taxi drivers;
- Taxi passengers were more likely to **oppose** the proposals than those who did not travel by taxi, as a passenger;
- Those who travelled by car were more likely to **oppose** the proposals than those who did not travel by car.



Level of support for proposals, as presented, amongst different transport users

SYSTIA

* Note, respondents to the consultation survey could fall into more than one category, due to the multiple response nature of the question.

Is there support for making the changes permanent?

Level of support also varied significantly by:

- Age: Those up to age of 34 years were most likely to support the proposals, followed by those aged 35-64 and those aged 65+ (80% compared with 55% and 42%);
- Gender: Those who identify as female were more likely than those who identify as male to support the proposals (63% compared with 58%);
- **Disability:** Those who do not have a disability or health condition that limits their day-to-day activities were more likely than those who do to support the proposals (61% compared with 45%); and
- Maternity: Those who have had a baby in the last 12 months were more likely than those who have not to support the proposals (70% compared with 60%).



Reasons for not supporting the proposals

The online survey respondents who reported opposition to the Beech Street proposals (49%) were given the opportunity to provide reasons for their opposition and the majority (80%) did so. Respondents could select as many reasons as they liked and also had the opportunity to add further reasons in a comments box. The chart shows reasons provided by more than 5% of opposing respondents.

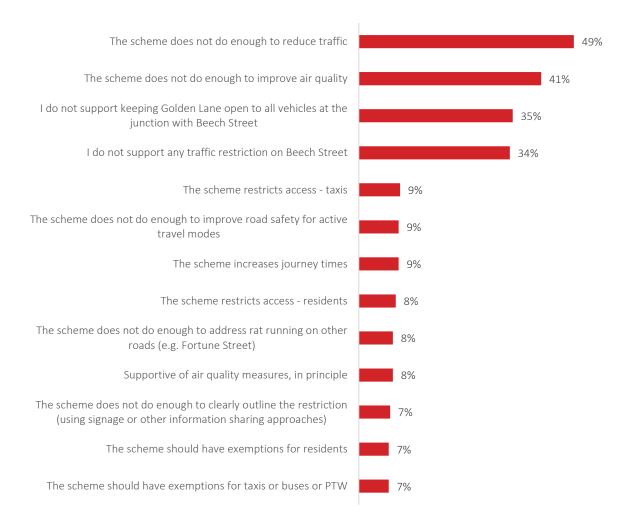
A common reason for not supporting the proposals was a feeling that the **scheme does not go far enough** to address the issues in the area, including (in order of prevalence):

- Traffic levels (49%);
- Air quality (41%);
- Road safety for active travel modes (9%); and
- Rat running on other roads (8%).

Other reasons key reasons not supporting the proposals included:

- Not supporting keeping **Golden Lane** open to all vehicles at the junction with Beech Street (35%); and
- Not supporting any traffic restrictions on Beech Street (34%).

Concerns for **access** were also common, including for taxis (9%), residents (8%), utilities/deliveries (4%), people with disabilities (4%), businesses (1%) and emergency services (1%).



If you said you 'Oppose' the proposals, we would like to understand why. What are your reasons for this? (MRQ; Base: 311)

SYSTIP

* Note, respondents could provide more than one answer so the percentages do not add up to 100%

Reasons for not supporting the proposals

Less common reasons for opposition were as follows:

- A feeling that the proposals are **unnecessary** due to air quality (5%) or traffic levels (3%) already being acceptable in the area, or the availability of existing alternative routes (3%);
- A concern that proposals would increase journey times (9%);
- Concerns about inadequate signage and other information on the scheme (7%); and
- A feeling that the proposals were only being introduced as a **revenue** generation exercise (5%).

Additionally, some opposing respondents suggested alterations to the scheme, such as **exemptions** for residents (7%), taxis, buses or powered-two-wheelers (7%), whilst others expressed support for air quality measures in principle, but took issue with certain aspects of the proposals for Beech Street, as presented (8%).

Other comments raised concerns about the **accuracy** of the data collection (2%) and **consultation** on the previous Beech Street scheme experimental traffic order (2%).



Reasons for not supporting the proposals

Whilst **opposing respondents could provide as many reasons as they liked** to describe why they opposed the Beech Street proposals, as presented, a small minority did just select one reason. For example:

- 35 stated that the only reason for their opposition was that they do not support any traffic restriction on Beech Street (11% of all opposing respondents who provided a reason for their opposition); and
- 3 stated that the only reason for their opposition was that they do not support keeping Golden Lane open to all vehicles at the junction with Beech Street (1% of all opposing respondents who provided a reason for their opposition).

This means that for the majority of opposing respondents, multiple reasons were given to explain their opposition. The table below shows how different reasons were selected together, for the key opposition reasons only (those provided by a third or more of respondents). For example:

- 30% of opposing respondents stated that the scheme does not do enough to improve air quality and reduce traffic;
- 23% of opposing respondents stated they do not support keeping Golden Lane open <u>and</u> the scheme does not do enough to reduce traffic.

	Lane open to all	The scheme does not do enough to improve air quality	The scheme does not do enough to reduce traffic	I he scheme does not do enough to improve road safety for active travel modes	address rat running on other	l do not support any traffic restriction on Beech Street
I do not support keeping Golden Lane open to all vehicles at the junction with Beech Street	-	9%	23%	5%	5%	7%
The scheme does not do enough to improve air quality	-	-	30%	5%	4%	9%
The scheme does not do enough to reduce traffic	-	-	-	5%	4%	12%
The scheme does not do enough to improve road safety for active travel modes	-	-	-	-	3%	3%
The scheme does not do enough to address rat running on other roads (e.g. Fortune Street)	-	-	-	-	-	2%
						(Base: 311)

SYSTIC

Page 125

Page 126

Reasons for not supporting the proposals

This page provides a selection of verbatim quotes to exemplify responses received to the consultation question: "If you said you 'Oppose' the proposals, we would like to understand why. What are your reasons for this?"

"The scheme pushes the traffic to other roads which creates more noise and air pollution for residents on those roads."

"The proposal to keep Golden Lane open to all vehicles turning left into the Beech Street tunnel has potentially disastrous consequences. Traffic flow will increase at the exit of the tunnel, thereby creating *more* pollution, noise and other forms of risk and disturbance for residents in Ben Jonson House and Cromwell Tower, as well as those in the street, in nearby offices, and possibly at Prior Weston School. If this scheme is to have maximum value, then all entry/exit points of the tunnel must benefit from reduced levels of non-emission vehicular traffic. The only viable option is therefore to bring back the closure of Golden Lane to all vehicles entering, or at the very least to restrict entrance to the tunnel via Golden Lane to non-emission vehicles."

"The trial was good but more needed to be done so traffic did not divert to nearby streets. Air quality is key and this will not improve it enough."

"The ULEZ has greatly reduced the traffic in the most polluting vehicles and this is likely to be enough to limit pollution in beech street adequately, without this scheme." "During the trial period ambulances and taxis and Uber vehicles were largely prevented from entering Beech St and as I am partially disabled and live on Beech Street this was very inconvenient. Also several delivery vehicles were unable to access Barbican properties."

"I have stopped cycling down Beech Street since the restrictions were removed as it is so polluted, however even with the restrictions it still feels unsafe cycling as the lanes aren't protected and electric vehicles used to speed along here. Some protection for cyclists would also be welcome."

"I am a disabled resident... I am dependent upon easy access to taxis in Beech Street to get around London for hospital appointments etc. ...during the last [trial] I found extreme difficulty in getting a cab or an Uber to drive up Beech Street to collect me... the reality was that the number of taxis largely dried up during the trial and left me effectively stranded in my flat. I am fearful that any re-implementation of the Zero Emissions for Beech Street will leave me trapped in my flat... it will also INCREASE overall emissions around the Barbican area... On behalf of myself and many other taxi-dependent residents of Beech Street I would ask that the scheme not be re-implemented."

SYSU

26

7 Email response feedback

Email feedback

Reasons for not supporting the proposals

In addition to responses being received via the consultation survey, a total of **38 responses were provided via email**.

"The problem with this proposal is that it simply pushes the traffic to other areas close by and in particular Fore Street. Moor Lane, Silk Street etc. These are all roads directly next to residential buildings so the problem just moves. This was what happened during the trial period."

"We are deeply disappointed that the filter at the bottom of Central Street/Golden Lane won't be returned. It was much more pleasant to cycle along Golden Lane and Beech Street when the amount of traffic was limited by this filter."

"The scheme is no longer justified since NO2 levels in Beech Street are now within the legal limit. NO2 levels in Beech Street have been falling for years and are a fraction of what they were in 2015. Regardless of traffic levels, they can only continue to fall as vehicles become cleaner and greener. The proposed restrictions are unnecessary." In line with the responses received via the consultation survey, email responses commonly expressed **opposition** to the proposals due to a perception that they **do not go far enough** to address the issues in the area, including (in order of prevalence): Traffic volumes; Air quality; Rat running on other roads; and Noise pollution.

Other reasons for not supporting the proposals, expressed within email responses, included:

- A perception that the scheme **restricts access** for elderly people, people with disabilities, utilities/deliveries, residents, taxis, and businesses (some respondents felt these access issues are exacerbated by other vehicle restrictions in the area);
- Not supporting keeping **Golden Lane** open to all vehicles at the junction with Beech Street;
- Not supporting any traffic restrictions on Beech Street;
- A feeling that the proposals are **unnecessary** as air quality/traffic levels are acceptable or will improve on their own, or there are existing alternative routes;

SYSTIC

- A perception that proposals will **increase journey times**; and
- A perceived lack of support from local residents.

Email feedback

Reasons for supporting the proposals

In contrast, some email responses offered **support** for the proposals, for reasons including **perceived improvements** in:

- Air quality;
- Pedestrian and cycle access;
- Road safety for active travel modes;
- o Traffic levels; and
- Noise pollution.

Some email responses included **suggestions for changes** to be made to the proposals, after which the scheme would be supported. These suggestions included:

- Providing **exemptions** for taxis, buses, powered-two-wheelers, residents, people with disabilities, or visitors to the Barbican Centre;
- Pairing the scheme with **other road restrictions** to reduce rat running;
- Improving **signage**, or other approaches to better inform drivers of the restrictions; and
- Reducing the severity of fines.

Other comments

Additionally, some email responses included comments in support of other measures in the area, such as:

- Measures to improve walking and cycling in the City;
- Measures to reduce traffic levels or speed of traffic;
- Adding fans to Beech Street; and
- Adding planting/greenery to Beech Street.

In line with the survey, a small number of comments provided via email included more general comments in relation to the accuracy of the baseline data collection, comments on the consultation itself, comments raising concerns about air quality more generally, and queries around the definition of 'zero emission capable vehicles'.

"We write to offer our support for the proposal to reintroduce the Beech Street Zero Emission Scheme... the previous Beech Street Zero Emissions Scheme was very effective at reducing levels of the toxic gas Nitrogen Dioxide. This also coincided with better bus journey times, reduced traffic levels, noise pollution and road danger, making it the sort of action we urgently need to improve public health."







Conclusions

This report

In 2020, the City ran an 18-month traffic experiment on Beech Street to reduce NO₂ levels. The experiment restricted polluting traffic from using Beech Street as a "through route" 24hrs a day. Unrestricted access was allowed for zero-emission capable vehicles and for any vehicle accessing properties and car parks on Beech Street. Following this experiment, the City have developed a new proposed permanent scheme for Beech Street, working with Islington Council.

This report presents the findings of a consultation on the new proposed changes to the Beech Street Zero Emissions Scheme.

Level of support

After being provided with detail on the proposals for the Beech Street Zero Emissions Scheme (as outlined in Chapter 4), similar numbers of respondents stated that they did (51%) and did not support (49%) the proposals, as presented.

Opposition for the proposals was highest from those: who reported living within the City; who reported using private vehicles, taxis or PHVs to travel around the area; and those who were disabled. This could suggest that some further consultation and engagement may be useful with these groups.



Conclusions

Reasons for support / opposition

Despite recognition that the Beech Street Zero Emissions Scheme could provide improvements in air quality, pedestrian and cycle access, road safety, traffic levels and noise pollution, a common reason for not supporting the proposals, as presented, was that the **scheme does not go far enough** to address these factors.

Concerns were also raised in relation to **opening the Golden Lane junction** on Beech Street. These concerns may suggest that an area-wide scheme to improve traffic levels, air quality and road safety may be beneficial in the Barbican, Golden Lane and Bunhill neighbourhood area, including specific measures to reduce traffic levels and improve air quality and road safety on Golden Lane. In line with this, support for an area-wide scheme was offered in longer form email responses.

Access for residents, taxis, utilities and deliveries, people with disabilities, local businesses and emergency services was also of concern, despite the outlined proposals noting that access would be retained to car parks and forecourts off of Beech Street for these purposes. This may suggest that clearer signage and detailed information provision are required to ensure access is not inadvertently hindered and to reassure residents.



SYSTRA.CO.UK

CONFIDENCE MOVES THE WORLD

Page 134

This page is intentionally left blank

Nitrogen dioxide (NO₂) concentrations along Aldersgate Street and Goswell Road

The data below is presented to give an indication of how the air pollution along Aldersgate Street compares to that in Beech Street, and where possible, how it impacts on residents in the area.

The monitors are located on lamp posts approximately 2m from the ground. There is a rapid reduction in concentrations of nitrogen dioxide with distance from the source, which in this case is road vehicles. This is due to dilution with cleaner air and atmospheric chemistry.

The Department of Environment Food and Rural Affairs provides a calculator to enable us to calculate the concentration at set distances away from the measuring location. The calculated values, given in the table below, are approximate, especially in the case of location C and E which are influenced by other roads as they are located on a junction.

The annual average NO₂ in Beech Street in 2022 (within the covered section) was 40.6 μ g/m3. This measurement was taken at the building façade. For comparison, if this was taken at 0.5m from the roadside, as is the case of most locations in Aldersgate Street, the concentration would be higher, probably about 45 μ g/m3. The pavement in this location is approximately 1.5m wide.

Our statutory obligations require us to take action if annual average concentrations are above 40 μ g/m3 anywhere in the Square Mile. However, if we are just considering impact on health alone, an annual average would apply to places where people spend a lot of time such as residential units, schools, hospitals and care homes. There is also an hourly average limit for nitrogen dioxide which is 200 μ g/m3. It is a lot higher than the annual average limit as people can tolerate higher concentrations, but just for a short period of time. As a rule of thumb, if the annual average is above 60 μ g/m3, it is likely that the hourly average would be breached. Again, if we are just considering impact on health alone, and not statutory obligations, this would apply anywhere that people spend an hour or more of their time.



Location	Measured average reading of NO2 in 2022	Calculated reading at building facade
A Goswell Road	34.7 μg/m3	30.4 μg/m3
	0.5m from the kerb	2.5m away, directly outside Crescent House flat window
B Aldersgate Street	43.5 μg/m3	35.2 μg/m3
	0.5m from the kerb	3.5m away, at the nearest façade, which isn't residential
C Corner of Aldersgate Street and	36.7 μg/m3	28.6 μg/m3
Beech Street	2.5m from the kerb	17m away, at Lauderdale Tower
D Aldersgate Street	43 μg/m3	34.4 μg/m3
	0.5m from the kerb	4m away at the nearest façade, which isn't residential
E M of L rotunda south side	36.7 μg/m3	29.1 μg/m3
(corner of Aldersgate Street & London Wall)	0.5m from the kerb	6m away, the nearest façade, which isn't residential

Page 136

This page is intentionally left blank

Agenda Item 5

Committees: Streets and Walkways Sub <i>[for decision]</i> Operational Property & Projects Sub <i>[for decision]</i>	Dates: 23 May 2023 3 July 2023
Subject: Moor Lane Environmental Enhancements Unique Project Identifier:	Gateway 4-5: Regular Detailed Design & Authority to Start
9441	Work
Report of: Executive Director Environment Report Author: Andrea Moravicova – City Operations	For Decision
PUBLIC	

1. Status Update	Project Description: Public realm enhancements in Moor Lane to provide greening and an improved walking environment, with the creation of a "linear park" and widened footways.
	A Gateway 3 Issue Report, approved in December 2020, gave authority to incorporate Section 278 works on the eastern side of Moor Lane, as part of the 21 Moorfields development, into the scope of the original project.
	Since that decision, officers have considered both elements of the project simultaneously to develop the design as whole.
	The implementation, however, will be phased to:
	 align the delivery of works to the eastern footway (referred to as Area A in this report), funded through a Section 278 contribution, to the developer's timeline; finalise the design proposals for the western footway (referred to as Area B in this report) following the public consultation at the end of 2021. Construction of west footway will commence once the design is finalised.
	The Gateway 4c-5 report for Area A was approved in July 2022. This report provides an update on the design of Area B and seeks approval to implement the scheme.
	RAG Status: Amber (Green at last report to Committee)
	Risk Status: Medium (Medium at last report to committee)

	Total Estimated Cost of Project (excluding risk): £2,968,680 The total cost for Area A, funded through Section 278 agreement, is estimated at £1,508,680. The total budget for Area B, funded through Milton Court Environmental Improvement Works (Section 106) payment and Climate Action Strategy Cool Streets programme, is set at £1,560,000			
	Change in Total Estimated Cost of Project (excluding risk): The total estimated cost of the project remains unchanged since the July 2022 report.			
	Spend to Date: £350,000 (Area B)			
	£78,294 (Area A)			
	Funding Source: Section 278 (Area A) and Section 106 and Climate Action Strategy Cool Streets programme (Area B).			
	Costed Risk Provision Utilised: N/A			
	Slippage: The Moor Lane project was paused in 2012 due to the 21 Moorfields development which would have impacted on the scheme, allowing officers to review aspects of the original design which had been approved in 2011. The design has now been reviewed in conjunction with the Section 278 highway works necessary to mitigate the impacts of the 21 Moorfields development which is programmed for completion in early 2024. It is now expected that the Section 278 element of the scheme will be implemented from summer 2023 (ten months later than estimated in July's gateway report following delays to the development timetable), once the site is available from the developer. This will be followed by the Moor Lane (western side) works in late summer / autumn 2023. It is expected that the Gateway 6 report will be submitted to committees in September 2024.			
2. Requested decisions	Next Gateway: Gateway 6: Outcome report			
	Next Steps:			
	 Deliver the Moor Lane works in two phases as follows: Area A – confined to the eastern footway and carriageway on Moor Lane adjacent to the development at 21 Moorfields (Already approved – July 2022). Area B – related to the western footway on Moor Lane and funded through the Milton Court Environmental Improvements Works (Section 106) payment. These works are the subject of this report. Finalise and approve the construction package for Area B with the City's Highway Term Contractor to prepare for a start on site in late summer / autumn 2023. Submit Gateway 6 outcome report. 			

Requested Decisions:

That Members of the Streets and Walkways Sub Committee:

- 1. Approve in principle the design as described in Section 4 and shown in Appendix 5;
- 2. Agree to delegate approval of the final elements of the design related to greening to the Director City Operations in consultation with the Chairman and Deputy Chairman of Streets and Walkways Sub-Committee once discussions with local residents have been concluded.
- 3. Authorise transfer of any design & evaluation underspend for Moor Lane Section 106 budget from the previous gateway to the Area B (Section 106) implementation budget.
- Approve budget increase of £110,000 funded from Climate Action Strategy Cool Streets programme. Allocation proposal was granted by Streets and Walkways Sub-committee on 15 February 2023 to support design and installation of climate resilience measures on Moor Lane.
- 5. Note the undertaking of a statutory consultation regarding the removal of the motorcycle bay in Moor Lane. The consideration of consultation responses, the decision as to whether to remove the motorcycle bay and the making of any resulting traffic order, is to be undertaken under the Executive Director's delegated authority in respect of traffic order making processes (unless there are unresolved objection to any such order, in which case it will be brought back to your Sub-committee to decide whether or not to proceed with the order).
- 6. Note the investigation of loading restrictions along the west kerb on Moor Lane. The undertaking of any statutory consultation the consideration of consultation responses, the decision as to whether to introduce loading restrictions and the making of any resulting traffic order, is to be undertaken under the Executive Director's delegated authority in respect of traffic order making processes (unless there are unresolved objection to any such order, in which case it will be brought back to your Subcommittee to decide whether or not to proceed with the order)

That Members of the Streets and Walkways and Operational Property Projects Sub Committee:

- 7. Note the total budget for Area B to be £1,560,000 and approve allocation of the available funds as shown in the section 3 below and Table 2 in Appendix 3.
- 8. Approve the Risk Register in Appendix 2 and approve the costed risk provision of £100,000; and delegate the drawdown of funds from the risk register to Executive Director Environment.
- 9. Delegate to the Executive Director Environment authority to approve budget adjustments, above the existing authority within the project procedures and in consultation with Chamberlains,

	between budget lines if this is within the approved total pro budget amount and within intended scope.							
	That Members of the Operational Property and Projects Sub Committee							
	10. Agree that the Corporate Programme Management Office, in consultation with the Chairman of the Operational Property and Project Sub Committee and Chief Officer as necessary, is to decide whether any project issues or decisions that falls within the remit of paragraph 45 of the 'City of London Project Procedure – Oct 2018' (Changes to Projects: General), as prescribed in Appendix 6 of this report, is to be delegated to Chief Officer or escalated to committee(s).							
3. Budget	The total cost of the project (excluding risks) is estimated at £2,918,680, with Area A fully funded by the developer through the Section 278 Agreement for 21 Moorfields and Area B funded through previously approved contribution from Milton Court Section 106 Agreement and the Climate Action Strategy Cool Streets programme.							
	Appendix 3 and the ta to implement Area B c conditions and primar the City Corporation's	designs and are ily utilising a pa	based on know	n highway				
	Resources Required to re	each the next Gat	eway (Area B)					
	Description	Approved Budget (£)	Resources Required (£)	Revised Budget (£)				
			70,000	255,486				
		92,245	-	92,245				
	Works	901,650	-	901,650				
	Contingency 2	211,755	-111,755	100,000				
	Planting							
		36,483	161,755	198,238				
	Highway	22.204	10.000	42.204				
		22,381	-10,000	12,381				
	TOTAL 1	1,450,000	110,000	1,560,000				
	Revised Funding Allocati	ion (Area B)						
		Current	Funding	Revised				
		Funding	Adjustments	Funding				
	Funding SourceAllocation (£)(£)Allocation (£)							
	S106 - Telephone							
	Exchange -							
	07/00092/FULL - LCE	300,000	-	300,000				
	S106 - Milton Court - 06/01160/FULEIA - LCE	1,150,000	-	1,150,000				
	CAS - Cool Streets and							
	Greening Programme	-	110,000	110,000				
	Total Funding							
	Drawdown	1,450,000	110,000	1,560,000				

	 The above costs cover: Approximately 15 hours a month for eight months associated with report writing, inputting into design, stakeholders' liaison and engagement throughout the construction and ensuring the overall project is progressed to agreed milestones and budget. Approximately seven hours a month for eight months for Group Manager oversight. A Highways project engineer, and manager oversight, to manage the technical constraints of the scheme, produce the construction package (including traffic management and liaison with statutory undertakers), and supervision of works on site. This equates to approximately 500 hours over the next eight months. Necessary utility diversions and works to the western footway on Moor Lane, including lighting, planting and sustainable drainage features. Costed risk provision of £100,000 is being requested from the contingency allocation, with £110,000 of the contingency reallocated to works' budget. Planting maintenance estimate includes litter picking and covers 20-year period. The estimates will be updated if necessary once the planting and greening elements are finalised.
4. Design summary	The project's main objective is to improve the walking environment and increase greenery in Moor Lane, whilst accommodating the requirements of the new development at 21 Moorfields (Area A). An outline proposal for an enhancement scheme in Moor Lane was included in the original Barbican & Golden Lane Area Enhancement Strategy, approved in 2008. Subsequently an evaluation report (equivalent to Gateway 4-5) for the scheme was approved in 2011, the design of which is shown in Appendix 5. The scheme was then put on hold in 2012 owing to the forthcoming 21 Moorfields development, and to allow officers to review elements of the approved design. The project was restarted via an Issue Report, approved in December 2020, which gave approval to review the design of the western footway due to technical constraints and to incorporate changes required to accommodate the 21 Moorfields development. The requirements of the development involve changes to the eastern footway and carriageway in Moor Lane (Area A). These works as part of part of the S278 were approved in July 2022 and were due to commence in the autumn of 2022. However, the development has experienced some delays and these works are not expected to start until summer 2023. A public consultation exercise on an updated design (shown in Appendix 5) for the western footway on Moor Lane (Area B), was undertaken in late 2021. This design takes the requirements for Area A into consideration. The public consultation received 86 responses. The feedback has been assessed and is summarised as follows:

 Desire to see implementation of mature trees and further greening to align more closely with the 2011 proposals; Installation of planters in place of some bollards on the eastern footway (incorporated in the approved design for Area A); Support for retaining the existing Clean Air Garden in some form as it has been created and is looked after by the local community. This element of the project, which is likely to require planning application, will be progressed alongside the main works at potentially slower rate. Relocation of the Meanwhile Moor Lane Garden was generally welcomed, however the aesthetics of this temporary scheme (i.e. concrete-clad planters) was supported as part of the permanent scheme.
The design for Area B has been updated accordingly (see plan in Appendix 5). Following more detailed sub-surface surveys street trees are proposed at the northern and southern end of Moor Lane, in addition to the three 'rain gardens' retained from the 2021 consultation design. One of the proposed trees will replace the existing sentry box at the southern end of the street; the removal of the box has been authorised by the City of London Police.
The central section of Moor Lane is constrained by sub-surface conditions, namely restricted depths and loading limits on the underground structure, and the presence of utilities at a shallow depth. This means street trees are not viable in this section. Therefore, it is proposed to widen the pavement by a minimum of 1.5 metres and install modular planters, modelled on the design of the Moor Lane community garden, to provide additional greenery without impacting the structure below.
In line with feedback from the consultation, the existing community garden at the northern end of Moor Lane, which is on Barbican Estate land, is recommended to be retained with some modifications. Further discussions surrounding maintenance of this and how this will work in practice are still required.
Greening proposals are being developed in consultation with the City Garden's team and a consultant and aim to introduce species of trees and lower level planting that will support biodiversity and provide all year round interest.
The proposals will upgrade the existing footways to Yorkstone to ensure consistency and high-quality of the City's streetscape. No alterations to traffic movement in the street are proposed as part of these proposals, with the carriageway width kept to minimum of 6 metres needed to accommodate two-way traffic and access to off- street premises.
Legal Implications In making determinations in respect of traffic orders regard must be had to the duty to secure the efficient use of the road network, avoiding

congestion and disruption¹ and the duty to secure the expeditious convenient and safe movement of traffic, having regard to effect on amenties².

Equalities implications

The equalities impact assessment (EQIA), see Appendix 7a, concluded that the proposal when implemented is likely to benefit users with protected characteristics through improved accessibility and comfort levels. These improvements would be enjoyed by all users and are likely to particularly benefit groups with protected characteristics related to age and disability.

The proposal was also assessed using the City of London Streets Accessibility Tool (CoLSAT), which enables street designers to identify how street features impact on the different needs of disabled people. The tool's key feature recognises that the needs of different groups of disabled people can be contradictory; that improving accessibility for one group may decrease accessibility for another. CoLSAT identifies the trade-offs that may be needed to ensure no one is excluded from using the City's streets and provides the basis for engagement and discussion to maximise the benefits for all.

CoLSAT Results Table							
	Total 0 scores* Total 1 scores'						
	– severe signific			ficant			
	accessibility access		sibility				
	issue issue						
	Before	After	Before	After			
Electric Wheelchair user	1	1	1	1			
Manual Wheelchair user	2	-	1	1			
Mobility Scooter user	4	-					
Walking Aid user	-	-	3	2			
Person with a walking impairment	2	1	7	5			
Long cane user	4	4	2	1			
Guide Dog user	2	1	5	3			
Residual Sight user	-	-	5	3			
Deaf or Hearing impairment	-	-	4	3			
Acquired neurological impairment	-	-	5	4			
Autism/Sensory-processing diversity	-	-					
Developmental Impairment	4	1	4	3			
Total	19	8	37	26			

Table above shows the severe and significant issues identified through the CoLSAT assessments of the existing conditions and the proposed design. The proposed scheme has a potential to improve the walking experience for all assessed characteristics. There are, however,

¹ S.16 Traffic Management Act 2004

² S.122 Roadaffic Regulation Act 1984

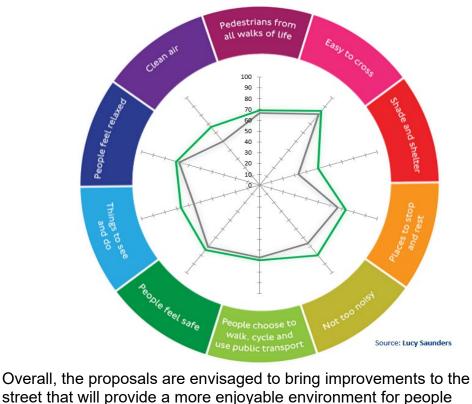
several significant accessibility issues that the scheme is unable to address. These relate to lack of taxi drop off points, bus stops and seating provision.an existing street furniture near the building line. Officers will continue working on addressing issues such as furniture close to the building line where possible whilst finalising the construction package to improve street's accessibility.

The EQIA and City of London streets accessibility assessment both recommend introduction of seating as part of this scheme to capitalise on the public realm improvements and shading associated with greening, and to provide a place to rest for those with limited mobility and stamina.

Healthy Streets assessment

Healthy Streets check, capturing ten elements deemed essential for making streets attractive and accessible places to walk, cycle and spend time, supporting social and economic activity, was undertaken on both the current arrangements and the proposed scheme.

The results of this check suggest a slight improvement to the area after the implementation of the scheme, although current layout's one "zero" score related to the carriageway widths available to cyclists remains featuring within the proposed design. The assessment also suggests that current seating provision is more in line with the Healthy Streets recommendations than no provision of seating as proposed through the scheme. The full scoring can be viewed in Appendix 7c.



Overall, the proposals are envisaged to bring improvements to the street that will provide a more enjoyable environment for people walking and are likely to encourage use of sustainable modes of transport.

	Seating is not currently proposed as part of the final design as local residents have expressed a string of concerns regarding this and how it may encourage unwelcomed dwelling, particularly in the evening which would have a noise impact on the residents facing these facilities. However, not providing seating will mean that Moor Lane will not be as accessible as it could be. It is proposed that appropriate seating is included within the design to improve street's accessibility. This will be incorporated in a way that reduces the likelihood of it being used by groups of people, such as individual seats, rather than benches. Traffic implication The proposal includes narrowing the carriageway to 6 metres from approximately 10 metres. This will allow for the footways to be widened, while providing sufficient space for two-way working, accommodating vehicular access to and from the service bays on Moor Lane. To retain provision of two disabled parking spaces, motorcycle parking would have to be removed. Off-street motorcycle parking facilities exist nearby in London Wall public car park. These bays have not been in use since April 2021 because of the development at 21 Moorfields. Removal of the motorcycle parking requires Traffic Orders under sections 6 and 45 of the Road Traffic Regulation Act 1984, to formally remove this bay. This will need to be the subject of statutory consultation and cannot be predetermined. The statutory consultation and decision-making process will be undertaken under officer's delegated authority pursuant to the Chief Officer Scheme to Delegation. However, if there are unresolved objections to the order
5. Confirmation that design solution will meet our SMART objectives	 the decision whether or not to make it will be brought back to your Subcommittee for determination. The recommended design option for Area B aligns with the project's success criteria and meets the objectives of the project's proposal to deliver a high quality, accessible walking environment that improves greening and environmental resilience in Moor Lane, whilst accommodating the requirements of the development at 21 Moorfields. This scheme contributes to delivering the following proposals of the Transport Strategy: Proposal 2: Put the needs of people walking first when designing and managing our streets. Proposal 5: Ensure new developments contribute to improving the experience of walking and spending time on the City's streets. Proposal 7: Provide more public space and deliver world-class public realm. And the following Corporate Plan outcomes: Outcome 9: We are digitally and physically well-connected and responsive. Outcome 12: Our spaces are secure, resilient and well maintained.

6. Delivery team	Project Management: CoL Projects and Programmes team Principal Designer: CoL Highways Construction Management: CoL Highways Principal Contractor: CoL Highways term contractor (FM Conway) Planting: CoL City Gardens team It is intended to use the Highways Term Contractor FM Conway to deliver this work.										
7. Programme and key dates	The implementation of Area B is proposed to com 2023* and will be co-ordinated with delivery of we are schedule to align with the 21 Moorfields deve	orks in Area A which									
	Activity	Date									
	Finalise construction package for Area B	June 2023									
	Procurement of materials following sign-off of the construction package	June 2023									
	Submit traffic management plan/permits	August 2023									
	Commence construction of Area B	September 2023									
	Snagging in Area B	May 2024									
	Gateway 6 Outcome Report for both phases	September 2024									
8. Risks	*Subject to changes in Developer's programme impact 1. Works are delivered outside the dates stat										
	A detailed phasing plan has been agreed in principle. Coordination meetings take place regularly to monitor progress.										
	2. Failing to agree the final design with reside	ents									
	Following additional surveys and trial hole trees were included in the north and south footway (Area B – subject of this report) in locations in the east footway to better align proposal. Ongoing discussions with the re representatives and Ward Members are un understanding of constraints and viability i proposed options in time for construction.	end of the west addition to two with the 2011 sidents' ndertaken to reach									
	 3. Presence of sub-surface utilities impacts on the delivery of th scheme Surveys and trial holes have been undertaken to minimise th risk as much as practicable. This risk will be closely monitore during the implementation phase. An allowance has been included in the project budget. 										
	 Complaints about noisy works Maintain a dialogue with local residents ar Work with the Environmental Health team stakeholders to ensure there is an agreed when noisy works take place. 	and local									

	5. Increase in the overall project costs
	The design for Area B was revised to ensure the costs remain within the original funding envelope. Costed risk provision of £100,000 to mitigate known risks is requested as part of this gateway. Any unforeseen increase in costs for Area A will be covered by the developer under the terms of the S278 Agreement.
	6. Third party approvals
	The works area lays directly above third-party structures, therefore, any designs and additional loading on these structures will require their agreement. Officers are liaising with said parties to ensure designs are approved.
	Further information is available in the Risk Register (Appendix 2).
9. Success criteria	 Improve the walking environment by aligning the public realm in Moor Lane with the City Public Realm Supplementary Planning Document.
	 Introduce greening and sustainable drainage to the west footway.
10.Progress reporting	 Monthly updates to be provided via Project Vision and any project changes will be sought by exception via Issue or Update reports to Spending and Operational Property and Projects Sub Committees should there be a fundamental change to the project scope.
	 Distribution of a regular e-bulletin to keep local stakeholders informed of project progress.

Appendices	
Appendix 1	Project coversheet
Appendix 2	Risk register
Appendix 3	Finance tables
Appendix 4	Plan showing the split between Area A and Area B
Appendix 5	a) Plan of the scheme approved in 2011
	b) Plan presented for consultation in 2021
	c) Plan of the recommended option for Area B
Appendix 6	Paragraph 45 of the 'City of London Project Procedure –
	Oct 2018' (Changes to Projects: General)
Appendix 7	a) Equality impact assessment
	b) City of London streets accessibility assessment
	c) Healthy Streets assessment

<u>Contact</u>	
Report Author	Andrea Moravicova
Email Address	andrea.moravicova@cityoflondon.gov.uk
Telephone Number	020 7332 3925

This page is intentionally left blank

Project Coversheet

[1] Ownership & Status

UPI: 9441 Core Project Name: Moor Lane Environmental Enhancements Programme Affiliation (if applicable): Culture Mile Project Manager: Andrea Moravicova

Definition of need:

Moor Lane has been identified as an area for improvement for several years, initially identified as a high priority project as part of the 'Barbican Area Streets and Walkways Enhancement Strategy' approved in 2008. Moor Lane presents an opportunity to respond to community priorities by increasing greening in the area and prioritising more space for pedestrians.

A scheme was developed and approved in 2011, which resulted from extensive consultation and proposed the creation of a linear park along Moor Lane. The proposals were to be funded by the Section 106 agreement for the Milton Court development and approval was granted to implement the scheme on site. However, the scheme was paused in light of the emerging 21 Moorfields development which is now under construction.

The City is now in a position to recommence work on this project and proceed with a review of the design for Moor Lane, to ensure it responds to the needs of the development and mitigates the development's impact on the local environment. There is strong stakeholder support for improvements to Moor Lane and an expectation for the scheme to finally be completed.

Key measures of success:

 Moor Lane is a green, biodiverse and environmentally resilient street through the introduction of trees and planting. Both the local community and the developer's priorities are met, by ensuring the security needs and desires for an improved pedestrian environment are delivered in coordination with the completion of 21 Moorfields. A welcoming, accessible and safe pedestrian environment is created on Moor Lane with widened footways to prioritise pedestrian movement.

Expected timeframe for the project delivery:

Implementation of Area A (eastern footway and carriageway) is expected to commence in March 2022. Implementation of Area B will follow as closely as possible.

Are we on track for completing the project against the expected timeframe for project delivery?

Changes to developer's programme have delayed the proposed start date for implementation of Area A by five months.

Has this project generated public or media impact and response which the City of London has needed to manage or is managing?

Yes??? – not sure

[2] Finance and Costed Risk

Headline Financial, Scope and Design Changes:

The project is part of the Barbican Area Streets & Walkways Enhancement Strategy and was approved as one of the strategy's high priority schemes by the Court of Common Council in 2008 following a public consultation exercise.

In July 2011 an evaluation report was approved by Members to implement environmental enhancements on Moor Lane.

Approval was granted to progress to detailed design stage, seek relevant permissions and implement the scheme. A budget of $\pounds1,391,136$ was made available following the report approval.

Evaluation report – approval for implementation (as approved by Street & Walkways Sub-committee 18/07/11)*:

- Total Estimated Cost (excluding risk): £1.55M
- Resources to reach next Gateway (excluding risk): £1.45M
- Spend to date: £257,526
- Estimated Programme Dates: Works were intended to commence in 2012.

Scope/Design Change and Impact: Create a linear park, with trees and planters, along the west footway on Moor Lane.

*It should be noted that the evaluation report approved in 2011 predated the current Gateway reporting procedure.

Gateway 3 - Issue report (as approved by Project Sub-committee on 30 November 2020 and Streets and Walkways Sub-committee 1 December 2020)*

- Total Estimated Cost (excluding risk): £1.7-£2.2M
- Resources to reach next Gateway (excluding risk): £230,382 (£128,566 from approved Section 106 budget and £101,816 funded through 21 Moorfields Section 278 agreement)
- Spend to date:
- Costed Risk Against the Project:
- Estimated Programme Dates:
 - Design review & surveys: Dec 2020 Mar 2021
 - Consultation: Mar May 2021
 - o Detail design: Jun Sept 2021
 - Gateway 4/5: Sept 2021
 - Construction package: Oct 2021– Feb 2022
 - Phased implementation (minimum 6 months): Spring 2022 late 2022/Early 2023

Scope/Design Change and Impact: The design aligns with the brief described within the Evaluation report, whilst considering the stakeholders' feedback to date, the changing context of the area and the development of the site at 21 Moorfields. The scope was increased to include the Section 278 works to east footway adjacent to the 21 Moorfields development.

An increase to the overall project budget has been incurred due to the revised scope, although this increase is fully funded through a Section 278 agreement.

*Upon approval of the 2011 report, officers were given authority to proceed with detail design and implement the scheme, however, several modifications required to the scheme outlined in the issue report, officers considered the existing scheme to be at Gateway 3 stage. It was, therefore, proposed that the next report to Members is a Gateway 4/5, outlining the detail design and requesting authority to start work.

Gateway 4c-5 – Detailed Design & Authority to Start Work (as approved by Streets and Walkways sub-committee on 5 July 2022 and Operational Property and Projects sub-committee in August 2022)

Total Estimated Cost (excluding risk):

- Total Estimated Cost (excluding risk): £2,958,680
- Resources to reach next Gateway (excluding risk): £1,448,680 (to implement \$278 works)
- Spend to date: £364,588
- Costed Risk Against the Project: £50,000
- Estimated Programme Dates:
 - Sign S278 Agreement and receipt of funds: July 2022
 - Procurement of materials following sign-off of the construction package: July 2022*
 - Submit traffic management plan / permits: July 2022
 - Construction package for Area A: August 2022
 - Phased implementation (minimum 6 months): October 2022**
 - Gateway 5 report related to Area B:
 - Snagging in Area A: June / July 2023
 - Gateway 6 outcome report for both phases (Area A & Area B): December 2023

*Subject to signing the Section 278 Agreement and receipt of funds from Developer. The lead in times for procuring materials are 12-16 weeks.

**Subject to changes to the Developer's programme and site release.

Scope/Design Change and Impact:

Some changes to design were made to incorporate greenery to the east footway design without compromising the security requirements of the development.

Total anticipated on-going commitment post-delivery [£]:

Revenue implications for highways maintenance are anticipated to be of minimum impact and will be confirmed at respective Gateway 5 when the detailed design will be finalised.

These costs will be assessed and covered by the project budget, thereby mitigating the impact on local risk budgets. The maintenance costs for Area A were calculated at $\pounds76,697$. Invoice to the developer will be issued upon completion of works.

Increased greening will entail an Open Spaces maintenance commitment and a provision for this will be included in the project budget. It should be noted that the proposed implementation of Sustainable Urban Drainage System (SUDS) in the scheme is expected to reduce the overall maintenance commitment.

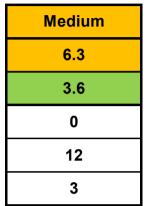
Programme Affiliation [£]: Culture Mile – the programme budget is assessed by financial year depending on the projects approved for delivery.

City of London: Projects Procedure Corporate Risks Register

Project name:	Moor Lane Environmental Enhancements	

Unique project identifier: 9441 Total est cost (exc risk) £2918680

PM's overall risk rating Avg risk pre-mitigation Avg risk post-mitigation Red risks (open) Amber risks (open) Green risks (open)



	Minor impact	Serious impact	Major impact
Likely	4	8	16
Possible	3	6	12
Unlikely	2	4	8
Rare	1	2	4

Costed risks identified (All) Costed risk pre-mitigation (open) Costed risk post-mitigation (open) Costed Risk Provision requested

		_
£225,000.00	8%	Costed risk as % of total estimated cost of pr
£225,000.00	8%	" "
£40,000.00	1%	" "
£100,000.00	3%	CRP as % of total estimated cost of project

lumber of Op Avg Costed impact Risk (1) Compliance/Regulatory 0.0 £0.00 0 0 0 (2) Financial £225,000.00 5 5.8 0 3 (3) Reputation 6 £0.00 0 6 6.3 (4) Contractual/Partnership 6.0 £0.00 0 1 1 (5) H&S/Wellbeing 6.0 £0.00 0 1 1 (6) Safeguarding 0 0 0 0.0 £0.00 (7) Innovation 0 0.0 £0.00 0 0 (8) Technology 0 0.0 £0.00 0 0 (9) Environmental 3.0 £0.00 0 1 0 (10) Physical 12.0 £0.00 0 1 1

			Extreme	Major	Serious	Minor	
Issues (open)	1	ExtremeMajorSeriousMinorOpen Issues0001All Issues0001£0.00Total CRP used to date£0.00					
All Issues	1	All Issue	s 0	0	0	1	
Cost to resolv (on	ve all issues completion)	£0.00	Total CRP	used to date	£0	.00	

Corporate Risk Matrix score tab

ble)	
	Extreme impact	
	32	
	24	
	16	

8

project

Green
0
2
0
0
0
0
0
0
1
0

							DAA's averall					A							1
F	Project Name:	Moor Lane Envir	onmental Enhan	cement	5		PM's overall risk rating: Medium		CRP requested this gateway	T_{-} IUNJUNNJ	unm	Average hitigated risk			6.3		Open Risks	15	
nique pro	oject identifier	9441					otal estimated £ cost (exc risk):	2,918,680				Average mitigated			3.6		Closed Risks	7	
neral risk cla Gateway	ssification Category	Description of the Risk	Risk Impact Description	Likelihood	Impact	Risk	Costed impact pre- Costed Risk	Confidence in the	Mitigation actions Mitigating actions	Nitigation Likelihood	l Impact	Costed	Post-	CRP used Us	e of CRP	Ownership Date	& Action Named Risk owner	Date	Comment(s)
,					o Classificatio n pre-		mitigation (£) Provision requested Y/N			cost (£) Classification on post-		iti impact post- mitigation (£)	Mitigat [·]			raised	Departmental Risk Officer or Manager/ External Party Coordinator	Closed OR/	
5	(3) Reputation	Project is not delivered to agreed timeline due to technical issues that arise either in design or construction phase	If security measures on Moor Lane are not completed prior to the occupation of 21 Moorfields, their tenant will not be able to occupy the building.	¹ Possible	Serious	6	£0.00 N		A programme will be developed taking the security requirements into account and the implementation will be phased to ensure compliance with the development's	£0.00 Possible	Minor	£0.00	3	£0.00		13/09/2020	Andrea Moravicova		
5	(2) Financial	Developer does not agree to full costs of the scheme	This will either extend the project timeline as negotiations would take longer or reduce the project scope to align with agreed costs		Serious	6	£0.00 N		As the design develops, the likely cost of the scheme will be established. The scope of the project will be tailored to ensure the scheme can be financed by the Section 106 and the Section 278 (where works are required to mitigate the impact of the 21	£0.00 Unlikely	Minor	£0.0C	2	£0.00		13/09/2020	Andrea Moravicova		
5	(4) Contractual/Par nership	t Delays in supply, issues in productivity or resource	Negative impact on project delivery, both monetarily an timewise, causing potential delays to programme and increasing costs.	nd	Serious	6	£0.00 N		Moorfields development). engaging with suppliers and term contractor to programme works and procure materials well in advance, allowing for at least 16 weeks lead in times. Reguof supply chain via existing meetings with principal contractor.lar monitoring	Unlikely	Serious	£0.00	4	£0.00			Andrea Moravicova		
5	(10) Physical	Unforseen technical and / or engineering issues identified	Late identification of any engineering or technical issues will disrupt delivery and may increase costs and timelines	d Possible	Major	12	£0.00 N		Undertake standard surveys and trialholes, visit sites during development construction	Unlikely	Serious		4	£0.00			Andrea Moravicova		
5	(2) Financial	The full cost of the project is unknown	If the costs are not ascertained soon enough in the project process, the design might exceed the available project budget	n Unlikely	Serious	4	£50,000.00 Y - for mitigation costs		As the design develops, the likely cost of the scheme will be established. The scope and design of the project will be tailored to ensure the scheme can be financed from the available project budget. Costed risk provision of £25,000 is being requested to mitigate any potential cost increases for Area B. The s.278 works will only commence once the costs are agreed with the	£25,000.00 Unlikely	Minor	£0.00	2	£0.00		14/09/2020	Andrea Moravicova		
5	(3) Reputation	Stakeholders object to the amended scheme	The City would not be delivering a scheme that is supported by the local community, and it would no therefore be responsive to their needs. A redesign would be required which could impact on the programme and budget.		Serious	6	£0.00 N		Consultation will be undertaken with stakeholders as part of the project process and the design will be adapted if required. Consultation was previously undertaken in 2011 and local stakeholders were supportive of the proposals. The Meanwhile Moor Lane scheme implemented in Autumn 2020 is gathering feedback from users and will inform	£0.00 Unlikely	Minor	£0.00	2	£0.00		05/10/2020	Andrea Moravicova		
5	(9) Environmental	reduced in scope to accommodate 21 Moorfield	The scheme would not fully be delivering on the previously approved objectives of the scheme, s missing an opportunity to deliver an enivronmentally resilient, biodiverse scheme.	Possible	Serious	6	£0.00 N		the nermanent scheme highway requirements and Moor Lane designs for the Western footway were reviewed together as one scheme by the relevant City officers. The technical feasibility and levels design will be progressed	£0.00 Possible	Serious	£0.00	6	£0.00		14/09/2020	Andrea Moravicova	31/05/2022	Scope for Area B has be confirmed now that the for Area A has been find
5	(4) Contractual/Par nership		If a new term contractor is selected with higher rates, the cost of the works would increase	Likely	Major	16	£0.00 N		A Tendër process will be undertaken, where a new contractor will be appointed. Notice will be given of any cost implications as soon as possible in the	£0.00 Likely	Serious	£0.00	8	£0.00		15/09/2020	Giles Radford		The new contractor rate now available and are used to cost the scheme
5	(3) Reputation	LUL object to the scheme on the basis of the scheme being located over their infrastructure	The project design would require further amendment, impacting project programme	Possible	Serious	6	£0.00 N		LUL will be consulted as soon as possible in the design process to ensure the design is developed in accordance with their requirements	£0.00 Unlikely	Minor	£0.00	2	£0.00		14/09/2020	Andrea Moravicova		

Risk Gateway ID	Category	Description of the Risk	Risk Impact Description	Classification	o Classificatio	Risk Costed impact pre score mitigation (£)	e- Costed Risk Provision requested	Confidence in the estimation	Mitigating actions	cost (£)	Classifico		Costed impact post-	Post- Mitigat t	CRP used Use of CRP to date	Date raised	Named Departmento	al (Named	Date Closed OR/	Comment(s)
				n pre- mitigation	n pre- mitigation		T/N				on post- mitigatioı	on post- n mitigation	mitigation (£)	risk score			Manager/ Coordinator	Officer or External Party)		
R10 5	(3) Reputation	delays	The implementation of the project would be delayed	Possible	Minor	3 £0.0	00 N		Implementation of the project is co-ordinated to align with the developer's programme. Delays in developer's construction were clearly communicated and accounted for in the	£0.00 F	Possible	Minor	£0.00	3	£0.00	14/09/2020		Andrea Moravicova		The start on site was reschedule to coincide with the developer's programme.
R11 5	(5) H&S/Wellbeing	A new national lockdown due to COVID-19 delays the programme, through an inability to carry out necessary surveys or trial boles	delay to programme	Possible	Serious	6 £0.0	00 N		follow guidance and undertake new ways of working as necessary.	£0.00 F	Possible	Minor	£O.OC	3	£0.00 £3,5	00 15/09/2020	Giles Radford	Andrea Moravicova		
R12 5	(2) Financial	The developer does not agree to commuted sums required for the s278	The cost of maintaining the s278 area post completion will increase and need to be funded by the City	Likely	Major	16 £0.0	00 N		The developer will be made aware of the maintainence implication of the s278 works, the HVM maintenance costs will need to be funded by the	£0.00 F	Possible	Major	£O.OC	12	£0.00	07/07/2021		Tom Noble/PM	23/09/2022	S278 agreement has now been signed. Commuted sums were agreed as aprt of this agreement.
R13 5	(4) Contractual/Par nership	The developer does not agree to the terms of the s278 agreeement	The programme will be delayed whilst the agreement takes longer to negotiate	Possible	Major	12 £0.0	00 N		Respond to the developer in a timely manner on comments and progress negotiations on elements		Possible	Serious	£0.00	6	£0.00	08/07/2021		Tom Noble / Andrea Moravicova	23/09/2022	S278 agreement has been signed
R14 3	(9) Environmental	causes delays to programme and cost increases due to unexpected clashes found after the detailed design	The programmme will be delayed to redesign the relevant area and liaise with utlilities, and also increases the project cost due to the re doing of design/approvals o diversion of utilities necessar	Likely e- rr	Extreme	32 £0.0	00 N		directly if needed Trial holes and site investigation to be carried out prior to implementation, utility clashes based on current information to be design of soon as possible	£0.00 l	Likely	Major	£0.00	16	£0.00	09/07/2021		Tom Noble/PM/Engin eer	07/05/2022	
R15 3	(1) Compliance/Re gulatory	s278 scope: Lack to utility	A H&S incident occurs on site, causing a legal dispute on liability and whether Principal Designer duties have been fulfilled	Possible	Extreme	24 £0.0	00 N		woraing to be included in the s278 agreement to make the developer awar of the risks and limit the City's liability were possible site investigations to be carried out prior to	e	Unlikely	Extreme	£0.00	16	£0.00	15/07/2021		Ben Manku/Giles Radford	07/05/2022	Standard Surveys and trial holes were undertaken in the area where security measures were proposed and the designs were adjusted accordingly.
R16 5	(9) Environmental	SUDS scheme not feasible due to underground constraints	The SUDS scheme would either have to be removed from the project scope or a redesign of the SUDS would be required which could impact project programme and costs		Minor	3 £0.0)0 N		The 2011 design will be reviewed as part of the project scope and amended as necessary. Surveys will be undertaker to ascertain the underground constraints of far as possible, in addition to consultation with LUL. The SUDS design can be further simplified to reduce costs if required. Updates will be provided as part of	s £0.00 l	Unlikely	Minor	£O.OC	2	£0.00	15/07/2021		Andrea Moravicova		
R17 5	(2) Financial	SUDS design costs more than anticipated	The SUDS scheme would either have to be removed from the project scope or a redesign of the SUDS would be required which could impact project programme and costs	Possible	Minor	3 £40,000.0	00 Y - for mitigation costs		A SUDS consultant will be appointed to progress to the SUDS design so a cost can be established early on in the design process. The design will be simplifie to reduce costs if required	£10,000.00 l	Unlikely	Minor	£0.00	2	£0.00	15/07/2021		Andrea Moravicova		
R18 5	(2) Financial	underground conditions / depths will require changes to design	The proposal to plant trees could be affected by insuficient depths or presence of underground utilities undetected through standard surveys and design will need to be revised.		Serious	8 £60,000.0	00 Y - for costed impact post-mitigation		known uning routes have been considered in the design, additional trial holes and site investigatio will be undertaken prior to implementation, data analysed and the design revised prior to	n	Possible	Serious	£40,000.00	6	£0.00	09/06/2022		Andrea Moravicova/Eng ineer		

City of Landon, Projecto Proceedure Cornerate lawsed or

City of London: Projects Procedure Corporate Issues Log Project Name: Moor Lane Environmental Enhancements]									
	Unique project identifier: 9441													
		Gen	eral issue classifi	ication						Ownershi	p & Action			
Issue ID	Risk ID (where previously identified)	Category	Description of the Issue	Issue Impact Description	Impact Classification	Control actions	Date raised	Named Departmental Issue Manager/ Coordinator	Issue owner (Named Officer or External Party)	Dependencies	Status	Cost to resolve [£] on completion	Date Closed	Comment(s)
1.01	R10	(3) Reputation	Delays to public realm works starting on site due to 21 Moorfields construction delays	The implementation of the project would be delayed	Minor	The start of implei programme.	mentation was reso	chedule in line with	the developer's					

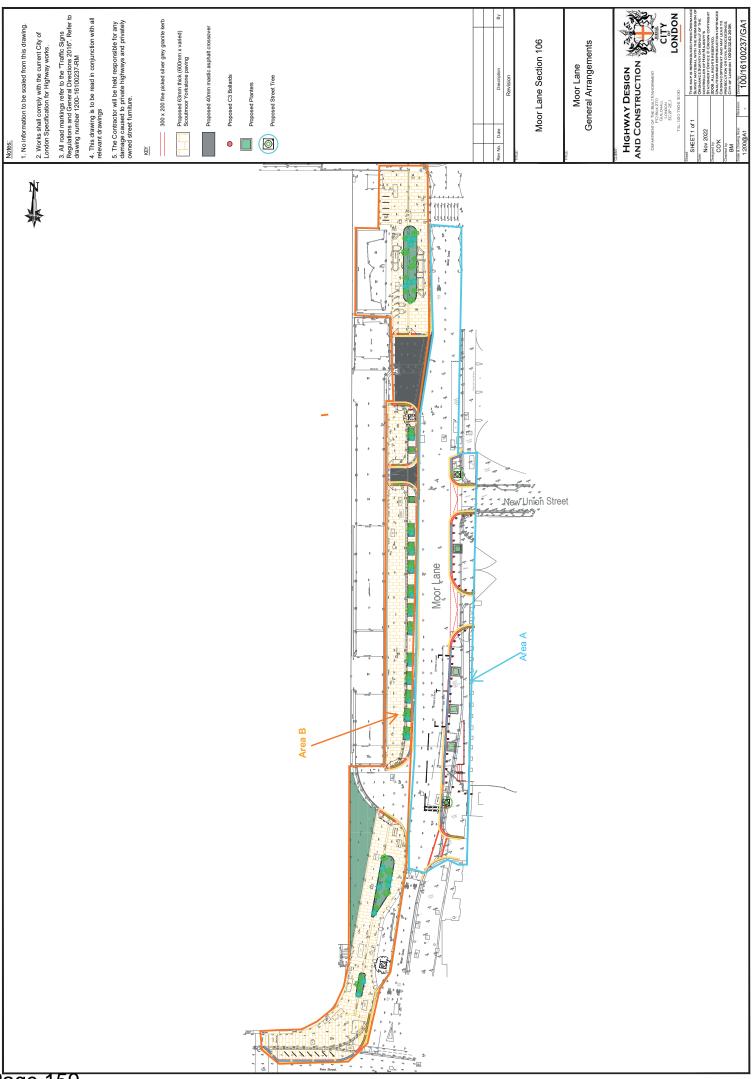
Appendix 3 - Moor Lane Area B

Table 1: Expenditure to Date - Moor Lane S106 - 16100237							
Description	Approved Budget (£)	Expenditure (£)	Balance (£)				
Env Servs Staff Costs	51,000	39,800	11,200				
Legal Staff Costs	2,000	52	1,948				
Open Spaces Staff Costs	1,759	544	1,215				
P&T Staff Costs	130,727	130,727	-				
Fees	86,245	63,515	22,730				
Traffic Orders	6,000	-	6,000				
Drainage Works	311,000	-	311,000				
General Works	479,324	106,972	372,352				
Lighting Works	40,000	8,510	31,490				
Planting	71,326	-	71,326				
Contingency	211,755	-	211,755				
Open Spaces Maintenance	36,483	-	36,483				
DES Maintenance	22,381	-	22,381				
TOTAL	1,450,000	350,120	1,099,880				

Table 2: Resources Required to reach the next Gateway							
	Resources	Revised Budget					
Description	(£)	Required (£)	(£)				
Env Servs Staff Costs	51,000	40,000	91,000				
Legal Staff Costs	2,000		2,000				
Open Spaces Staff Costs	1,759	5,000	6,759				
P&T Staff Costs	130,727	25,000	155,727				
Fees	86,245		86,245				
Traffic Orders	6,000		6,000				
Drainage Works	311,000	- 200,000	111,000				
General Works	479,324	200,000	679,324				
Lighting Works	40,000		40,000				
Planting	71,326	110,000	181,326				
Contingency	211,755	- 110,000	101,755				
Open Spaces Maintenance	36,483	50,000	86,483				
DES Maintenance	22,381	- 10,000	12,381				
TOTAL	1,450,000	110,000	1,560,000				

Table 3: Revised Funding Allocation							
Funding Source	Current Funding Allocation (£)	Funding Adjustments (£)	Revised Funding Allocation (£)				
S106 - Telephone Exchange -							
07/00092/FULL - LCE	300,000	-	300,000				
S106 - Milton Court -							
06/01160/FULEIA - LCE	1,150,000	-	1,150,000				
CAS - Cool Streets and							
Greening Programme	-	110,000	110,000				
Total Funding Drawdown	1,450,000	110,000	1,560,000				

This page is intentionally left blank



This page is intentionally left blank

Appendix 5 a) 2011 indicative plan for Moor Lane



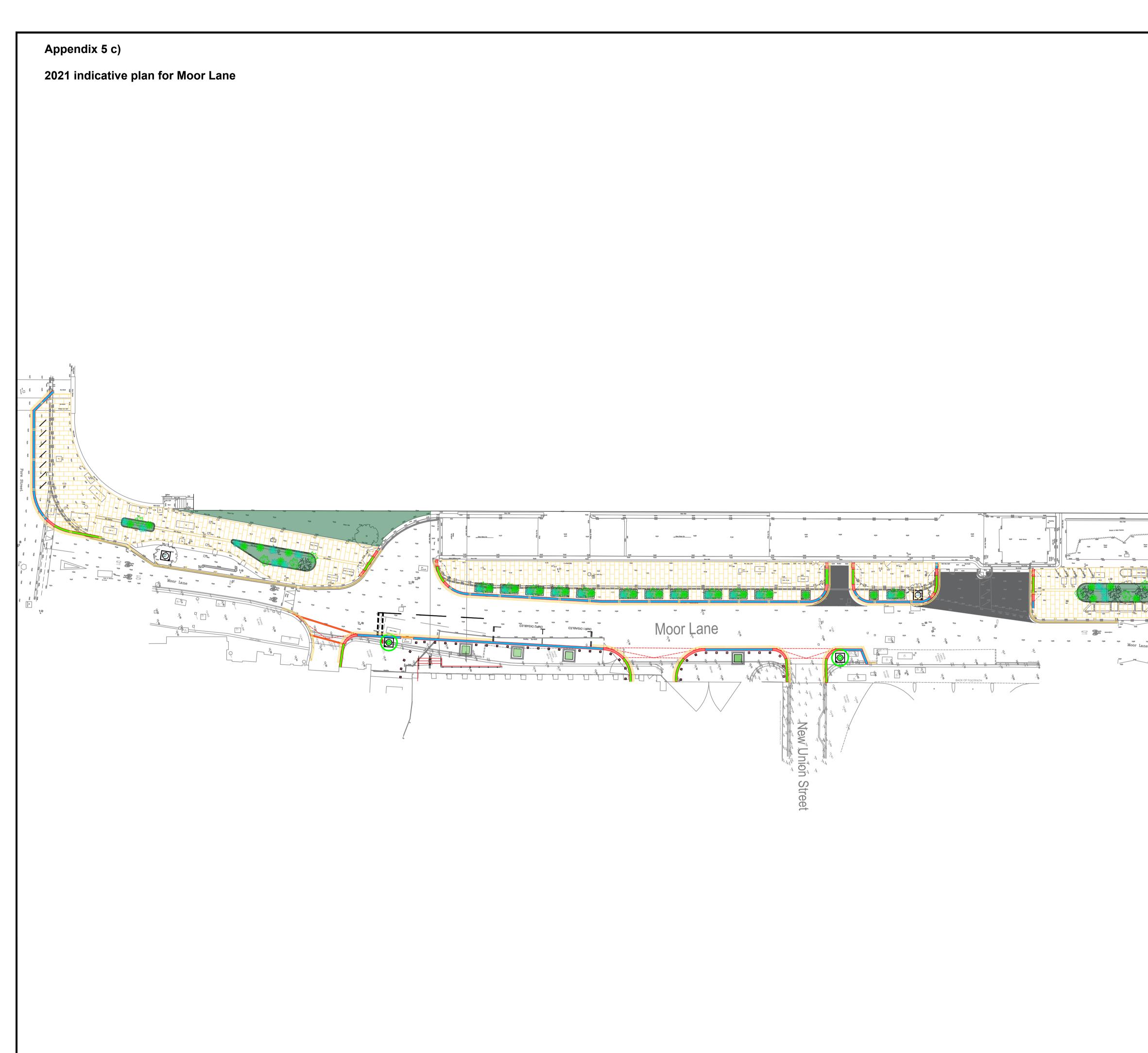
Appendix 5 b)

2021 indicative plan for Moor Lane









Page 163

	Notes:					
	1. No informati	on to be scaled from this dra	awing.			
		comply with the current City ication for Highway works.	of			
	Regulations ar	kings refer to the "Traffic Sig d General Directions 2016". er 1200-16100237-RM				
	4. This drawing relevant drawing	g is to be read in conjunction ngs	i with all			
		etor will be held responsible f d to private highways and po urniture.	-			
	KEY					
	300	x 200 fine picked silver grey gra	nite kerb			
		posed 63mm thick (600mm x vari	ied)			
		utmoor Yorkstone paving				
		posed 40mm mastic asphalt cros	sover			
		posed C3 Bollards				
f	Pro	posed Planters				
E E	Pro Pro	posed Street Tree				
1 1 1 2 2						
140 N						
5 						
циа пдо чиа а <u>на зна на</u> на чиа пдо чиа <u>на зна зна на</u> н <u>иа на на</u> по <u>на зна зна зна на</u> <u>10</u> <u>100 100 100 100 100 100 100 100 100 10</u>						
	Rev No. Date	Description	Ву			
	TITLE:	Revision				
	Moo	or Lane Section 106				
	TITLE:					
	Ge	Moor Lane neral Arrangements				
	CLIENT:		A			
		AY DESIGN				
	DEPARTMENT OF THE BUILT ENVIORMENT					
	G	UILDHALL CONDON				
		LOI 20 7606 3030	NDON			
	SHEET 1 of 1 Date:	THIS MAP IS REPRODUCED FR SURVEY MATERIAL WITH THE ORDNANCE SURVEY ON BEHA	PERMISSION OF ALF OF THE			
	Nov 2022 Designed by:	CONTROLLER OF HER MAJES STATIONERY OFFICE © CROV 2006. ALL RIGHTS RESERVEI UNAUTHORISED REPRODUCT	WN COPYRIGHT D.			
	CO'K ^{Checked by:} BM	CROWN COPYRIGHT AND MAX PROSECUTION OR CIVIL PROC CITY OF LONDON 10002324	Y LEAD TO EEDINGS.			
	Scale & Drawing Size: 1:200@A1	Revision: Drawing No: - 100/16100237	7/GA1			

Page 164

This page is intentionally left blank

City of London Project Procedure

Oct 2018

<u>Overview</u>

- 1. Projects are one of the key ways that the City of London Corporation delivers its strategic aims and priorities. The City Corporation is committed to ensuring that projects are delivered efficiently and that the best use is made of the resources available to the organisation.
- 2. The Project Procedure is approved by the Policy and Resources Committee. Any changes to the Project Procedure require the authorisation of the Policy and Resources Committee.
- 3. The Project Procedure has been designed to encourage consistency of delivery across the organisation, while allowing flexibility to respond to circumstances with appropriate speed. It is designed to ensure that our work reflects our strategies, and that we have policies in place to discharge our statutory and non-statutory duties with proper oversight and control.
- 4. All projects over £50,000 that have tangible, physical deliverables (including IS projects) must be recorded on the Corporation's Project Portfolio Management tool.
- 5. The Project Procedure applies to the following categories of projects that have tangible, physical deliverables (including IS projects):
 - a. Capital and supplementary revenue projects over £50,000
 - b. Routine revenue projects over £250,000
 - c. Capital and supplementary revenue projects delivered with ringfenced funds over £250,000 (e.g. Section 278, Designated Sales Pools, Additional Works Programmes, Housing Revenue Account)
- 6. Some large Capital projects will be overseen by the Capital Buildings Committee, indicatively where the project is £100m+ or where it has been referred there by the Court of Common Council. For these projects, Capital Buildings Committee will be responsible for;
 - (i) overall direction
 - (ii) review of progress; and
 - (iii) decisions on significant option development and key policy choices.

If oversight is transferred to the Capital Buildings Committee those projects will not be required to be seen at Projects Sub-Committee. Refer to the Capital Building Committee Clerk for guidance on governance and reporting requirements.

7. The Projects Procedure does not apply for Capital and supplementary revenue projects under £50,000 or revenue projects under £250,000 or ringfenced projects under £250,000. Where a mixture of funding is used the lowest threshold will apply. It is recommended the Gateway process documentation is used for projects outside of the Projects Procedure. Projects of any value can be 'called in' to Projects Sub-Committee and any that develop to be within the thresholds will then enter the gateway approval process.

7.1 Delegations exist within the projects procedure. Where delegations are made (to Chief Officer) it is expected that the gateway approval process documentation will be completed, even if it is not required to be presented to Member committees. This is to ensure that good governance and record keeping is maintained. Chamberlains Audit and Risk teams will conduct period audits of projects under the thresholds or under delegated approval limits to ensure that appropriately rigorous governance and documentation is maintained.

8. This document contains information about:

Governance Resource Allocation Timetable Approval Process Ringfenced Funds Routine Revenue Projects Changes to Projects: Before Agreement at Authority to Start Work The Project Sum Risk and Costed Risk Provision Changes to Projects: After Agreement at Authority to Start Work Procurement and Contract Letting Project Toolkit

 If you have any queries or comments about the Project Procedure or about project management generally at the City Corporation, please contact the Town Clerk's Programme Office Corporate.ProgrammeOffice@cityoflondon.gov.uk

Changes to Projects: General

- 45. In cases where:
 - the financial implications will be higher or lower than the agreed confidence range (capital or revenue expenditure or income/returns/savings);
 - the overall programme needs to be accelerated or delayed +/- 10% of time against the last numbered Gateway report;
 - the specification will be significantly different to that agreed, i.e. there will be a shortfall against one of more of the key objectives/ SMART targets, or the inclusion or reduction in the parameters of the project, which may include changing operational performance criteria and business benefits;

Officers will report to the Committee(s) or Chief Officer who approved the last Gateway report on the circumstances, the options available and a recommended course of action. For example, if circumstances change on the Light and Regular routes where Authority to start work is delegated to Chief Officer, they would need to return to Committee to progress to the next gateway.

If additional unallocated City Corporation resources are required (i.e. from Central resources, not local risk budgets), the approval of the Policy and Resources Committee must also be obtained as Service Committees cannot approve Central resources.

In such cases the Policy and Resources Committee must be advised of the impact of the proposed increase in the City's overall Programme and any agree increase must be reported to the next meeting of the Resource Allocation Sub-Committee for appropriate adjustments to be made to the City Corporation's Programme.

Note that Chamberlains have prepared guidance on the preparation of Whole Life Costing (available on the corporate intranet).

These will not apply to the costed risk provision drawdown increases to budgets as they have already been considered and delegated [See 49]:

This page is intentionally left blank

EQUALITY ANALYSIS (EA) TEMPLATE

Page

169

Click or tap here to enter text.

Date

Click or tap here to enter text.



What is the Public Sector Equality Duty (PSED)?

The Public Sector Equality Duty (PSED) is set out in the Equality Act 2010 (s.149). This requires public authorities, in the exercise of their functions, to have 'due regard' to the need to:

- Eliminate discrimination, harassment and victimisation
- Advance equality of opportunity between people who share a protected characteristic and those who do not, and
- Foster good relations between people who share a protected characteristic and those who do not

The characteristics protected by the Equality Act 2010 are:

- Age
- Disability
- Gender reassignment
- Marriage and civil partnership
- Pregnancy and maternity
- Race
- Religion or belief
- Sex (gender)
- Sexual orientation

What is due regard?

- It involves considering the aims of the duty in a way that is proportionate to the issue at hand
- Ensuring real consideration is given to the aims and the impact of policies with rigour and with an open mind in such a way that is influences the final decision

The general equality duty does not specify how public authorities should analyse the effect of their business activities on different groups of people. However, case law has established that equality analysis is an important way public authorities can demonstrate that they are meeting the requirements.

Case law has established the following principles apply to the PSED:

- **Knowledge** the need to be aware of the requirements of the Equality Duty with a conscious approach and state of mind.
- **Sufficient Information** must be made available to the decision maker.
- **Timeliness** the Duty must be complied with before and at the time that a particular policy is under consideration or decision is taken not after it has been taken.
- **Real consideration** consideration must form an integral part of the decision-making process. It is not a matter of box-ticking; it must be exercised in substance, with rigour and with an open mind in such a way that it influences the final decision.
- Sufficient information the decision maker must consider what information he or she has and what further information may be needed in order to give proper consideration to the Equality Duty.
- No delegation public bodies are responsible for ensuring that any third parties which exercise functions on their behalf are capable of complying with the Equality Duty, are required to comply with it, and that they do so in practice. It is a duty that cannot be delegated.
- **Review** the duty is not only applied when a policy is developed and decided upon, but also when it is implemented and reviewed.

What is an Equality Analysis (EA)?

An equality analysis is a risk assessment tool that examines whether different groups of people are, or could be, disadvantaged by service provision and decisions made. It involves using quality information, and the results of any engagement or consultation with particular reference to the protected characteristics to understand the actual effect or the potential impact of policy and decision making decisions taken.

The equality analysis should be conducted at the outset of a project and should inform policy formulation/proposals. It cannot be left until the end of the process.

The purpose of the equality analysis process is to:

- Identify unintended consequences and mitigate against them as far as possible, and
- Actively consider ways to advance equality and foster good relations.

The objectives of the equality analysis are to:

- Identify opportunities for action to be taken to advance quality of opportunity in the widest sense;
- Try and anticipate the requirements of all service users potentially impacted;
- Find out whether or not proposals can or do have any negative impact on any particular group or community and to find ways to avoid or minimise them;
- Integrate equality diversity and inclusion considerations into the everyday business and enhance service planning;
- Improve the reputation of the City Corporation as an organisation that listens to all of its communities;
- Encourage greater openness and public involvement.

However, there is no requirement to:

- Produce an equality analysis or an equality impact assessment
- Indiscriminately collect diversity data where equalities issues are not significant
- Publish lengthy documents to show compliance
- Treat everyone the same. Rather, it requires public bodies to think about people's different needs and how these can be met
- Make service homogenous or to try to remove or ignore differences between people.

An equality analysis should indicate improvements in the way policy and services are formulated. Even modest changed that lead to service improvements are important. In it is not possible to mitigate against any identified negative impact, then clear justification should be provided for this.

By undertaking and equality analysis, officers will be able to:

- Explore the potential impact of proposals before implementation and improve them by eliminating any adverse effects and increasing the positive effects for equality groups
- Contribute to community cohesion by identifying opportunities to foster good relations between different groups
- Target resource more effectively
- Identify direct or indirect discrimination in current policies and services and improve them by removing or reducing barriers to equality

How to demonstrate compliance

The Key point about demonstrating compliance with the duty are to:

- Collate sufficient evidence to determine whether changes being considered will have a potential impact on different groups.
- Ensure decision makers are aware of the analysis that has been undertaken and what conclusions have been reached on the possible implications.
- Keep adequate records of the full decision making process.

In addition to the protected groups, it may be relevant to consider the impact of a policy, decision or service on other disadvantaged groups that do not readily fall within the protected characteristics, such as children in care, people who are affected by socio-economic disadvantage or who experience significant exclusion or isolation because of poverty or income, education, locality, social class or poor health, ex-offenders, asylum seekers, people who are unemployed, homeless or on a low income.

Complying with the Equality Duty may involve treating some people better than others, as far as this is allowed by discrimination law. For example, it may involve making use of an exception or the positive action provisions in order to provide a service in a way which is appropriate for people who share a protected characteristic – such as providing computer training to older people to help them access information and services.

Taking account of disabled people's disabilities

The Equality Duty also explicitly recognises that disabled people's needs may be different from those of non-disabled people. Public bodies should therefore take account of disabled people's impairments when making decisions about policies or services. This might mean making reasonable adjustments or treating disabled people better than non-disabled people in order to meet their needs.

Deciding what needs to be assessed

The following questions can help determine relevance to equality:

- Does the policy affect service users, employees or the wider community, including City businesses?
- How many people are affected and how significant is the impact on them?
- Is it likely to affect people with particular protected characteristics differently?
- Is it a major policy, significantly affecting how functions are delivered?
- Will the policy have a significant impact on how other organisations operate in terms of equality?
- Does the policy relate to functions that engagement has identified as being important to people with particular protected characteristics?
- Does the policy relate to an area with known inequalities?
- Does the policy relate to any equality objectives that have been set?

Consider:

- How the aims of the policy relate to equality.
- Which aspects of the policy are most relevant to equality?

Version Control Version:1.1 Author: Marie Gallagher Last updated: 08/05/2023 Date of next review: • Aims of the general equality duty and which protected characteristics the policy is most relevant to.

If it is not clear if a policy or decision needs to be assessed through an equality analysis, a Test of Relevance screening tool has been designed to assist officers in determining whether or not a policy or decision will benefit from a full equality analysis.

Completing the Test of Relevance screening also provides a formal record of decision making and reasoning. It should be noted that the PSED continues up to and after the final decision is taken and so any Test of Relevance and/or full Equality Analysis should be reviewed and evidenced again if there is a change in strategy or decision.

Role of the assessor

An assessor's role is to make sure that an appropriate analysis is undertaken. This can be achieved by making sure that the analysis is documented by focussing on identifying the real impact of the decision and set out any mitigation or improvements that can be delivered where necessary.	Depending on the subject it may be helpful and easier to involve others. Input from another service area or from a related area might bring a fresh perspective and challenge aspects differently.
Who else is involved?	In addition, those working in the customer facing roles will have a particularly helpful perspective. Some proposals will be cross-departmental and need a joint approach to the equality analysis.
Chief Officers are responsible for overseeing the equality analysis proves within departments to ensure that equality analysis exercises are conducted according to the agreed format and to a consistent standard. Departmental equality representatives are key people to consult when undertaking an equality analysis.	

How to carry out an Equality Analysis (EA)

There are five stages to completing an Equality Analysis, which are outlined in detail in the Equality Analysis toolkit and flowchart:	2.3 – Developing an action plan – set out the action you will take to improve the positive impact and / or the mitigation action needed to eliminate or reduce any adverse impact that you have identified;
2.1 Completing the information gathering and research stage – gather as much relevant equality-related information, data or research as possible in relation to the policy or proposal, including any engagement or consultation with those affected;	2.4 Director approval and sign off of the equality analysis – include the findings from the EA in your report or add as an appendix including the action plan;
2.2 Analyse the evidence – make and assessment of the impact or effect on different equality groups;	2.5 Monitor and review – monitor the delivery of the action plan and ensure that changes arising from the assessment are implemented.

The Proposal

Assessor Name:	Marie Gallagher	Contact Details:	Click or tap here to enter text.

What is the Proposal

The City of London Corporation is looking to implement public realm enhancements on Moor Lane to provide greening and an improved pedestrian environment, with the creation of a "linear park" and widened footways. The works will upgrade the existing surface materials to the City's standard palette to ensure quality and consistency of the City's streetscape, without altering the traffic movement in the street. Details on the proposed works is provided below. Moor Lane is a local access road and forms part of an established north-south cycle route. The road is closed to motor vehicles during the night and throughout the weekend by a means of a gate at the southern end.

An outline proposal for an enhancement scheme in Moor Lane was included in the original Barbican & Golden Lane Area Enhancement Strategy, approved in 2008. Subsequently an evaluation report (equivalent to Gateway 4-5) for the scheme was approved in 2011. The scheme was then put on hold in 2012 owing to the forthcoming 21 Moorfields development. The design has now been reviewed in conjunction with the Section 278 highway works necessary to accommodate the needs of the 21 Moorfields development which is programmed for completion in early 2023. The Section 278¹ works around 21 Moorfields are funded by the developer and will be undertaken by the City of London's contractor, FM Conway. The works are due to be completed by 2024.

Proposed Works:

Moor Lane – Western Footway

- Footway widening and resurfacing, using Yorkstone paving, on the western side of Moor Lane between Fore Street and Silk Street
- Implementing multiple planters along the length of Moor Lane between the Barbican estates access roads
- Installation of 'Rain Gardens' on the north and south end of the western footway
- Carriageway resurfacing across car park entrances (proposed 40mm mastic asphalt crossover)
- Relocation of five existing Sheffield cycle parking stands
- Installation of seven new Sheffield cycle parking stands at the Moor Street junction with Fore Street (situated on the section of widened footway)
- Removal of police box at the southern end of Moor Lane

• Upgrade and minor adjustments to the lighting on the western footway in line with the Public Realm and Lighting Design² guidelines to accommodate proposed greening

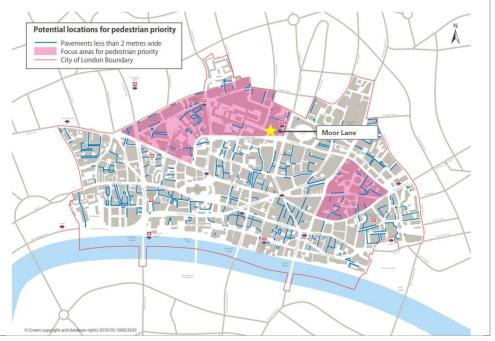
Moor Lane – Eastern Footway

- Footway reconstruction on the eastern side of Moor Lane, outside the development, between the southern access road and just north of New Union Street
- Tree planting and installation of planters
- Installation of multiple HVM security C3 bollards (static) along the boundary of the development
- Implementation of two loading bays and two disabled bays

As mentioned above, this design does not propose any changes to traffic movement in the area and minimal changes are expected to the levels and drainage. In addition to this, the bollards at the southern end of Moor Lane, including the security gate, will be retained as part of the proposed design.

Although small in scale, these works align with the City of London's Transport Strategy (2019)³ to introduce pedestrian priority streets. Figure 1 illustrates that Moor Lane is in one of the City of London's Key focus areas for pedestrian priority, in the Moorgate and Barbican Area. The proposed works also align with Proposal 5 of the City's Transport Strategy³, which states that new developments should contribute to improving the experience of walking and spending time on the City's streets.

Figure 1: City of London's Potential Locations for Pedestrian Priority (Transport Strategy, 2019)



² <u>https://www.cityoflondon.gov.uk/services/streets/public-realm-and-lighting-design-guidance</u>

³ City of London Transport Strategy

Author: Marie Gallagher

1. What are the recommendations?

Given that the proposals are at the preliminary design stage (See Appendix A 101-16100237 – GA2 drawing for more details), it is highly recommended that the following are considered to mitigate any negative impact on protected characteristic groups when developing the detailed design:

- Dropped Kerbs: In line with the DfT's Inclusive Mobility Guide 2021⁴, it is recommended that appropriate dropped kerbs are provided along the length of Moor Lane to enable easy access for elderly people, particularly those using mobility aids, as well as those travelling with young children in pushchairs. Further to this, it is recommended that dropped kerbs are implemented adjacent to the disabled bays outside 21 Moorfields to enable those with limited mobility and/or mobility aids to comfortably access the site.
- Tactile Paving: The extent of tactile paving for the proposed works is yet to be defined however, in line with Department for Transport's (DfT) Inclusive Mobility Guide 2021 guidance⁴ and Guidance on Use of Tactile Paving⁵, it is recommended that tactile paving is in place at each of the junctions of both controlled and uncontrolled crossings to aid visually impaired people.
- Footway Widths: Given the central location of Moor Lane and the high footfall associated with nearby trip attractors, it is advised that the renewed footways are the appropriate width to accommodate the existing and any subsequent increase in trip generation and footfall associated with 21 Moorfields. This will prevent vulnerable road users, which includes people with disabilities, as well as elderly people and young people, from having to cross the road unnecessarily and/or utilise the carriageway, improving road safety for users. It is recommended that the footway widths are designed in conjunction with TfL's Pedestrian Comfort Guidance Technical guide (See Appendix B⁶). This is particularly important along the eastern footway and southern section of the western footway where there is a risk of pinch points and street clutter associated with the existing and proposed bollards, as well as trees and planters.
- Bollards: It is understood that the bollards proposed on the eastern footway along the development boundary are to act as a Vehicle Security Barrier (VSB). If so, these should be placed at a maximum of 1.2 metres apart to enable passage of wheelchair and mobility scooter users whilst providing adequate protection for pedestrians. Bollards should also be at least 1000mm in height and not connected by a chain or rope, as this might present a trip hazard, particularly for those with visual impairments. Bollards should also have tonal/colour contrasted tops and potentially some 'guidance path surfaces' to ensure they are visible and detectable. These recommendations also align with DfT guidance⁴ and Guidance on the Use of Tactile Paving Surfaces⁵. It is understood that the existing bollards at the southern end of Moor Lane are being retained therefore it is recommended that the arrangement of these bollards follow the above guidance also.
- Cycle Parking: The type of cycle stands should be considered to include provision that can accommodate cargo bikes, tandems, tricycles, and side-by-side cycles. This could help to encourage users of all abilities to visit the site and surrounding area by bike⁴. Adequate lighting should also be provided to improve security (see lighting below for more details).
- Greening: The planting of trees and installation of 'Rain Gardens' and planters is a key part of the proposed scheme. It is therefore recommended that their location and arrangement are developed in consultation with landscape architects and the designs align with existing guiding principles. This will help to prevent street clutter, ensure visibility, and avoid impeding informal crossing points⁷. Consideration should also be given to the tree species, selecting those with minimal leaf shedding to avoid a slippery footway. Street maintenance could also be procured to carry out appropriate clearing during the Autumn. In addition to this, the

addition of seating at the edge of planters and/or rain gardens could also be considered to capitalise on the public realm improvements and shading associated with the greening, and to provide a place to rest for those with limited mobility and stamina.

- Lighting: The proposals include upgrading and minor adjustments to the existing lighting on the western footway in line with the Public Realm and Lighting Design Guidelines² to accommodate the proposed greening. Full details on the upgrades/adjustments are not included in the General Arrangement, however it is recommended that Moor Lane is lit appropriately to prevent any anti-social behaviour, improve user safety for groups vulnerable to crime and further aid visually impaired members of the public. It is recommended that streetlights and signs should be mounted on walls or buildings whenever possible; if not, then placing them at the back of the footway as near the property line as possible is acceptable. If they are placed on the kerb-side of the footway, they should be at least 450mm away from the edge of the carriageway⁴.
- Footway Maintenance: Yorkstone paving is proposed along Moor Lane which may require maintenance. This is because uneven and/or gaps between paving slabs can cause issues for some users, including those who are vision impaired, wheelchair users, and those using crutches and sticks⁴. Vegetation and tree roots can grow between slabs, so this will also need to be regularly monitored and maintained.
- Construction: A Construction Environmental Management Plan (CEMP) or Construction Logistics Plan (CLP) should be implemented to minimise construction impacts of the scheme and construction in the local area. It should include measures such as suitable diversion routes with appropriate signage and temporary ramps for any required footway closures, noise and pollution mitigation, and an appropriate CLP to avoid sensitive receptors such as schools. Liaison with stakeholders, including emergency services, should also be undertaken to inform them of the diversion routes. Places of worship located near to the site should be included in the stakeholder list and be informed of any out of hours works, allowing consideration of service times and religious holidays during the construction phase. On completion of the works, the develop could also offer a guide to familiarise the changes to those who are visually impaired.
- Road Safety Audit: A Stage 3 Road Safety Audit should also be completed on completion of the works to ensure that the improvements are accessible i.e., ensuring sufficient dropped kerbs and tactile paving, and that surfaces are flush, and finish is suitable for use.

Version Control Version:1.1

⁴ <u>https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1044542/inclusive-mobility-a-guide-to-best-practice-on-access-to-pedestrian-and-transport-infrastructure.pdf</u>

⁵ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1046126/guidance-on-the-use-of-tactile-paving-surfaces.pdf

⁶ Pedestrian Comfort Guidance for London (tfl.gov.uk)

⁷ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1072722/Essex_Manual_for_Streets_Redacted.pdf

2. Who is affected by the Proposal? *Identify the main groups most likely to be directly or indirectly affected by the recommendations.*

The proposed scheme is located in the City of London, within the Coleman Street and Cripplegate Wards. The City of London is a key commercial district, hosting the primary business district for the capital. The proposed scheme is located adjacent to the Barbican Centre, a large performing arts centre, and the Barbican estate, the largest housing area in the City of London, and is also surrounded by key office and retail/hospitality space. Moor Lane is easily accessible via Moorgate London Underground station (two-minute walk), as well as Liverpool Street, Barbican and Bank London Underground stations.

Given the proposed works are located within a key commercial district and the area boasts a high Public Transport Accessibility Level (PTAL) rating of 6b⁸, those that are likely to be affected by the proposals are pedestrians, cyclists, and other non-motorised users. A large proportion of these users are likely to be of the working population commuting to their places of work. The City of London estimates approximately 513,000 daily commuters⁹ and this specific development, which will provide 564,000 sq. ft of business space, will generate a significant number additional commuter trips to the area. 21 Moorfields will also house a multi-level wellness centre, retail space, and restaurants, attracting recreational users, residents, and tourists, all of whom will be affected by the proposed scheme.

Although a predominantly business district, several other trip generators are located within close proximity of Moor Lane, which will attract users to the area who may also be affected by the proposed works and construction. These include the Barbican Estate, places of worship, schools, and health facilities which have been detailed in the full assessment below. The site is easily accessible by sustainable modes of transport therefore users are most likely to travel to these trip generators on foot, by bike or public transport. Looking more specifically at residents, although the population of the City of London is comparatively small compared to other London boroughs, residents living in the City have the highest overall active, efficient, and sustainable mode share (93%)¹⁰, suggesting that residents are also likely to benefit from the improvements. This includes the approximately 4,000 people who reside within the Barbican Estate, located immediately adjacent to the proposed works.

Moorgate London Underground Station is the nearest station to Moor Lane, located approximately 300 metres from the site. Moorgate is on the Circle, Metropolitan, Hammersmith & City and Northern London Underground Lines, and the Great Northern Line connecting The City to North London and Hertfordshire. Liverpool Street station is also accessible from Moorgate Station. Moorgate has step free access to all lines. The nearest bus stop is 120 metres away on City Wall. This is served by the 8, 11, 25, 26, 76, 100, N8, N11, N25, N26, N242, N551 in both directions. Barbican London Underground Station, about 500 metres from the site, does not have step free access. Barbican is served by the Circle, Metropolitan and Hammersmith and City Lines.

During the construction phase, some protected characteristic groups, particularly disabled and elderly/younger groups, may be adversely impacted if the appropriate pedestrian diversions, noise and pollution mitigation, and CLPs are not in place. Further to this, although the works may require a short term/temporary road closure, it is not considered that this will lead to access issues for those with protected characteristics. This is because Moor Lane will still be open and vehicle access will be

⁸ https://tfl.gov.uk/info-for/urban-planning-and-construction/planning-with-

webcat/webcat?Input=Moor%20Lane%2C%20London%2C%20UK&locationId=EhVNb29yIExhbmUsIExvbmRvbiwgVUsiLiosChQKEgIX8P7Oqxx2SBEVzse7r6LpIRIUChIJ8 MXt1sbdkgRCrIAOXkukUk&scenario=Base% 20Year&type=Ptal

⁹ https://www.cityoflondon.gov.uk/about-us/about-the-city-of-london-corporation/our-role-in-london#:~:text=In%20just%201.12%20square%20miles,commuters%20and%2010m%20annual%20visitors ¹⁰ https://content.tfl.gov.uk/travel-in-london-report-13.pdf

maintained throughout construction. A full assessment of the potential impacts on each of the protected characteristic groups with regards to construction is provided below.

Age

Check this box if NOT applicable

Age - Additional Equalities Data (Service Level or Corporate) Include data analysis of the impact of the proposals

The Office for National Statistics (ONS) 2021¹¹ population statistics for the City of London states a total population of 8,580 for the borough. The age breakdowns for the City of London and London are detailed in Table 1 below:

Table 1: Age Breakdown for City of London and London (Source: ONS Census Data 2021)

Age	City of London %	Greater London %
Under 5 years	2.5%	6%
5 to 15 years	3.9%	12.1%
16 to 24 years	13.8%	12.3%
25 to 64 years	65.8%	57.8%
65 years and over	14.1%	11.9%
Total	100%	100%

This figures above illustrate that the City of London has significantly fewer people under the age of 15 (6.4%) compared to Greater London (18.1%). Conversely, the City of London has a slightly higher percentage of people aged 16 to 24 years and 65 years and over, when compared to Greater London. The percentage of people aged 25 to 64 years is similar between the City of London and Greater London region.

Version Control Version:1.1 Author: Marie Gallagher

¹¹ https://www.nomisweb.co.uk/sources/census_2021_bulk

Table 2: Workforce Age Structure, City of London and Greater London 2011 (Source: City of London Workforce CENSUS 2011- Analysis by Age and Occupation)

Age Band	City of Lor	ndon	Greater Lo	ndon
	Actual	%	Actual	%
16 - 19	2,521	1%	81,959	2%
20 - 24	26,806	8%	387,569	9%
25 - 29	67,481	19%	685,431	15%
30 - 34	70,450	20%	697,643	16%
35 - 39	56,574	16%	591,814	13%
40 - 44	45,902	13%	548,352	12%
45 - 49	35,964	10%	507,549	11%
50 - 54	24,541	7%	405,451	9%
55 - 59	14,941	4%	295,937	7%
60 - 64	8,293	2%	196,176	4%
65 - 69	2,370	1%	73,115	2%
70 - 74	863	0%	29,485	1%
Total	356,706	100%	4,500,481	100

Table 2 shows the age breakdown of the workforce of the City of London compared to Greater London. The figures show that the ages of 25-34 contribute a substantial proportion of the workforce at 39%. The same age range for Greater London comprises 31% of the workforce. This shows that the City of London has a greater proportion of young professionals compared to Greater London. Similarly, the 35-49 age group comprises 39% of the workforce in the City of London, compared to 36% of the Greater London workforce. The percentage of the workforce in the City of London aged 50 years and above (14%) is lower than the percentage for Greater London (23%), showing that the City of London has a smaller proportion of older professionals. Further to this, the most recent census data (2021) shows that the City of London has a workforce much younger than the rest of the country, with 61% of workers aged between 22 and 39¹².

Sensitive receptors

With regards to sensitive receptors relevant to age, there are some schools and colleges located within 500 metres of the proposed works where higher proportions of children and young people are likely to be concentrated. These include:

• City of London School for Girls – 250 metres west of the proposed scheme

Author: Marie Gallagher

Last updated: 08/05/2023 Date of next review:

¹² <u>https://www.cityoflondon.gov.uk/assets/Business/city-stats-factsheet-2023.pdf</u> <u>Version Control</u> Version:1.1

- Guildhall School of Music and Drama 130 metres west of the proposed scheme
- University of Law London Moorgate 260 metres north of the proposed scheme
- Bayes Business School 350 metres north of the proposed scheme
- Bright Horizons Nursery 450 metres northwest of the proposed scheme
- London School of Business and Finance 350 metres north of the proposed scheme
- Barbican Playgroup 200 metres west of the proposed scheme
- Richard Cloudesley School 350 metres northwest of the proposed scheme
- One5 Health City Private GP Clinic 300 metres southeast of the proposed scheme
- Broadgate General Practice 360 metres southeast of the proposed scheme
- Barbican Dental Practice 200 metres southwest of the proposed scheme
- City Chiropody and Podiatry Barbican 150 meters west of the proposed scheme
- St Bartholomew's Hospital 500 meters west of the proposed scheme

There are also Boots stores in close proximity to the proposed scheme which provide pharmacy facilities.

What is the proposal's impact on the equalities aim? Look for direct impact but also evidence of disproportionate impact i.e., where a decision affects a protected group more than the general population, including indirect impact

Research by TfL has found that walking is the most frequently used mode of transport by older Londoners aged 65 and over¹³, with 87% walking at least once a week. Looking at the census data above, a relatively large proportion of the City of London's population (14.1%) would therefore benefit from the proposals to enhance, green, and improve the pedestrian environment on Moor Lane. Further to this, it is also important to note that the Barbican Estate, located adjacent to the proposed works, consists of a high percentage of single person households, with 32% over 65 years old¹⁴, all of whom could benefit from the improved pedestrian environment on Moor Lane.

The proposals to widen and resurface some of the footways on Moor Lane would be particularly beneficial to elderly people who are more likely to have limited mobility and may be reliant on mobility aids. These individuals require sufficient

What actions can be taken to avoid or mitigate any negative impact or to better advance equality and foster good relations?

It is highly recommended that the following is considered to mitigate any negative impact on elderly and younger people when developing the detailed design:

- Dropped Kerbs: In line with the DfT's Inclusive Mobility Guide 2021⁴, it is recommended that appropriate dropped kerbs are provided along the length of Moor Lane to enable easy access for elderly people, particularly those using mobility aids, as well as those travelling with young children in pushchairs.
- Footway Widths: It is advised that the renewed footways are the appropriate width to accommodate any forecasted increase in footfall associated with the redevelopment at 21 Moorfields. This will prevent vulnerable road users, particularly elderly and younger people¹³, as well as those using mobility aids, from having to cross the road to avoid congestion

Version Control Version:1.1

¹³ <u>Travel in London: Understanding our diverse communities 2019 (tfl.gov.uk)</u>

¹⁴ <u>https://kkremoval.co.uk/living-in-barbican/#:~:text=The%20area%20is%20mostly%20populated,being%20of%20the%20White%20race</u>.

width and quality footway surfacing in order for the space to be accessible and comfortable to use. Research undertaken by Age UK underlines this intersectionality between age and disability further, with figures showing that 52% of those aged 65 and over are disabled compared with only 9% under 64¹⁵. Street trees and planting can also play a key role in helping to remove harmful PM10 particulates and NO2 roadside emissions¹⁶ and mitigating against climate change impacts such as heating of streets (and provision of shaded areas), both of which young people and elderly people are disproportionately affected by¹⁷¹⁸.

Although the City of London has a smaller population under the age of 15 compared to London as a whole, 6.4% compared to 18.1% respectively, children and young people attending the educational establishments located within 500 metres of the proposed works, could also benefit from the improved pedestrian environment on their journeys to school / college.

Looking more specifically at some of these educational establishments, the scheme could be likely to deliver particular benefits to Richard Cloudesely School, as primary school aged pupils are more likely to travel to school by active modes¹⁹, are more at risk of road danger¹³ and their parents are more likely to be travelling with young children in pushchairs. Mode of travel data from the City of London School for Girls also shows that the majority of their pupils travel to school by public transport therefore it is likely that pupils at this school would also benefit from the improved pedestrian environment on their journeys to and from local bus stops and stations²⁰.

Conversely to this however, the proposals to implement a number of bollards, combined with street trees and planters, on the eastern footway could have an adverse impact on those reliant on mobility aids and those travelling with young children/pushchairs as they could potentially create street clutter and obstacles if inappropriately positioned. Similarly, although the design proposes to implement two disabled bays on the eastern side of the carriageway, enabling doorstep access

and/or step in the carriageway to pass other pedestrians. It is recommended that the footway widths are designed in conjunction with TfL's Pedestrian Comfort Guidance Technical guide (See Appendix B⁶).

- Bollards: It is understood that the bollards proposed on the eastern footway along the development boundary are to act as a Vehicle Security Barrier (VSB). If so, these should be placed at a maximum of 1.2 metres apart to enable passage of wheelchair and mobility scooter users, many of whom are more likely to be elderly, whilst providing adequate protection for pedestrians. This recommendation also aligns with DfT guidance⁴. In addition to this, it is understood that the exiting bollards at the southern end of Moor Lane, near the Fore Street junction, will be retained, which should already be placed at a maximum of 1.2 meters apart, however the location of the bollards and the proposed Rain Garden will need to be considered to maintain sufficient widths and avoid street clutter and pinch points.
- Greening: It is recommended that the height of the planters and associated plants, including the species, are considered so to ensure that pedestrians are visible to motorists at all times. This is particularly important at the northern and southern ends of Moor Lane, where the 'Rain Gardens' are located, and where the majority of pedestrian crossing activity is likely to take place (particularly at the northern end where the zebra crossing is located). As above, the positioning of street trees and planters, combined with the aforementioned bollards, on the eastern footway will need to be considered to maintain sufficient widths and avoid street clutter and pinch points. The addition of seating at the edge of planters and/or rain gardens could also be considered to capitalise on could also be considered to

¹⁵ https://www.ageuk.org.uk/london/about-us/media-centre/facts-and-figures/

¹⁶ <u>https://www.london.gov.uk/sites/default/files/valuing_londons_urban_forest_i-tree_report_final.pdf</u>

¹⁷ https://www.unep.org/news-and-stories/blogpost/young-and-old-air-pollution-affects-most-vulnerable

¹⁸ <u>https://www.gov.uk/government/publications/health-matters-air-pollution/health-matters-air-pollution</u>

¹⁹ <u>https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/476635/travel-to-school.pdf</u>

²⁰ <u>https://clsg.org.uk/admissions/travelling-to-city/#:~:text=Most%20travel%20by%20public%20transport,can%20be%20found%20under%20FAQs.</u>

to some of the key trip generators in the area, the design lacks dropped kerbs which can have an adverse impact on how accessible these bays are for elderly, disabled users.

Construction:

Several potential negative impacts on elderly and younger people have been identified if the appropriate measures are not in place during the construction phase²¹. These include:

- Wheelchair and mobility aid users may find it difficult to utilise temporary ramps
- Construction noise can negatively affect elderly and young people
- Construction can also generate additional dust and pollutants which negatively impact people with respiratory or long-term illnesses

Young people travelling to schools in the area may also be affected on their journeys if the appropriate footway diversions are not in place during construction²². Further to this, construction traffic to the site may increase traffic risk to vulnerable road users, which includes both elderly and young people.

Summary:

In summary, the positive impacts associated with the improved pedestrian environment and public realm, are likely to be felt by all users, including residents, visitors, and commuters to the area, regardless of age.

Despite the high percentage of Barbican Estate residents being over 65 and the schemes proximity to educational establishments, it should be acknowledged that a high proportion of those visiting the area are likely to be travelling to their place of work. As illustrated in Table 2, those commuting to the City of London are most likely to be between the ages of 25-49 (78% of the workforce) and are therefore not considered vulnerable to the factors listed above due to their age.

the greening, and to provide a place to rest for those with limited mobility and stamina.

- Cycle Parking: It is recommended that the short stay cycle parking at the southern and northern ends of More Lane should be designed to provide stands that can accommodate cargo bikes, tandems, tricycles and side-by-side cycles, to encourage users of all abilities to visit the area by bike⁴, and ensure the stands are well lit as they are currently located next to an entrance to an underground private car park, which could encourage bike theft. CCTV can also be considered to improve security.
- Construction: A CEMP or CLP should be implemented to minimise construction impacts²². It should include measures such as suitable diversion routes with appropriate signage for any required footway closures as well as noise mitigation. The CLP should consider any educational establishment located near the site, ensuring the construction routes avoid key routes to and from nearby schools and access / deliveries are arranged outside of school operating times. Continued liaison with stakeholders should also be undertaken to inform the plans.
- Road Safety Audit: A Stage 3 Road Safety Audit should also be completed on completion of the works to ensure that the improvements are accessible i.e., ensuring sufficient dropped kerbs and flush surfaces.

²¹ Transport, health and wellbeing (publishing.service.gov.uk)

²² Code of Practice for Deconstruction and Construction Sites (cityoflondon.gov.uk)

Key borough statistics:

- The City of London is dominated by businesses and the residential population is significantly lower compared to other London boroughs.
- The City has proportionately more people aged between 25 and 69 living in the Square Mile than in Greater London. Conversely, there are fewer younger people. Approximately 762 children and young people under the age of 19 years live in the City. This is 9% of the total population in the area.
- There is a smaller percentage of younger people (under 25) working in the City of London in comparison to Greater London, as well as a smaller percentage of over 45s. There is a larger percentage working in the City in the 25-44 age bands in comparison to Greater London.
- Summaries of the City of London age profiles from the 2011 Census can be found on our website

Disability

Disability - Additional Equalities Data (Service Level or Corporate) Include data analysis of the impact of the proposals

ONS disability and well-being 2021 analysis shows that disability can negatively affect wellbeing. For example, the average well-being ratings for people aged 16 to 64 with a self-reported long-standing illness, condition or impairment which causes difficulty with day-day activities between 2014 to 2021 showed lower scores for life satisfaction each year²³. Looking at the City of London more specifically, 56.6% of people in the City of London described themselves as having 'very good health' (see Figure 3 below) and just 0.7% reported as having 'very bad health' (Figure 4) and 2.4% as having 'bad health' (Figure 5)²⁴. As shown in the Figures below, compared to other London boroughs, the City of London has one of the highest proportions of people reporting to have 'very good health' and one of the lowest proportions of people reporting to have 'very good health' and one of the lowest proportions of people reporting to have 'bad' and 'very bad health'.

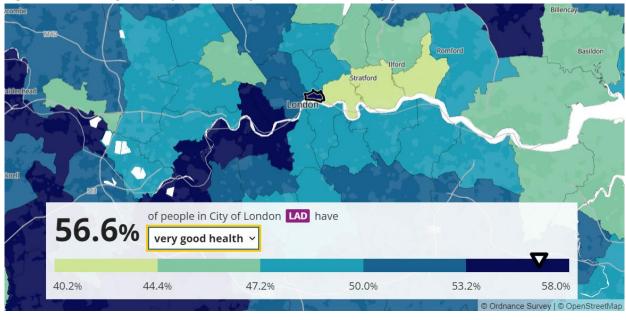


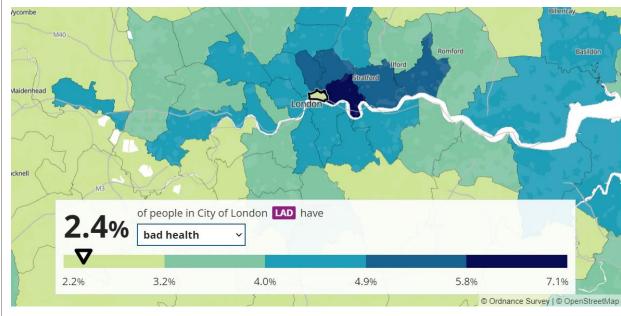
Figure 3: Percentage of People in the City of London with 'Very good health' (Source: ONS Census data 2021)

²³ <u>https://www.ons.gov.uk/peoplepopulationandcommunity/healthandsocialcare/disability/datasets/disabilityandwellbeing</u>

²⁴ <u>https://www.ons.gov.uk/peoplepopulationandcommunity/healthandsocialcare/healthandwellbeing/bulletins/disabilityenglandandwales/census2021</u>



Figure 4: Percentage of People in the City of London with 'Very bad health' (Source: ONS Census data 2021)



Version Control Version:1.1 Author: Marie Gallagher

Last updated: 08/05/2023 Date of next review: Further to this, Figure 6 shows the percentage of the City of London residents who considered their day-to-day activities to be limited by disability or long-term illness compared to other London boroughs. The City of London compared favourably, as it has the lowest percentage at 3.9%.

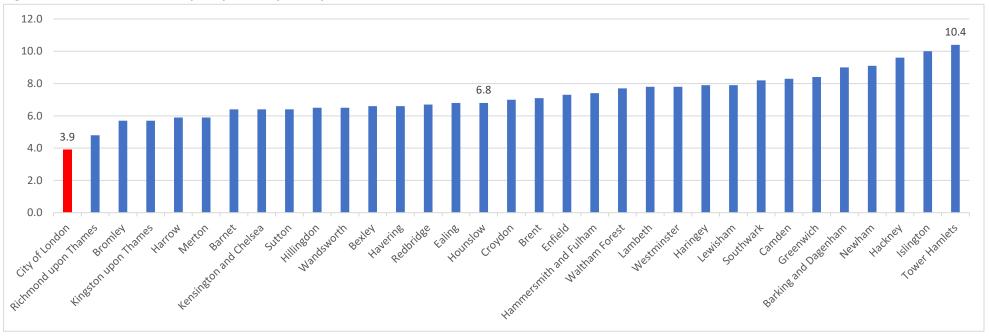


Figure 6: Disabled under the Equality Act: Day-to-day activities limited a lot (Source: ONS Census 2021)

Public Health England statistics support the above trend, as they report the percentage of people with a limiting long-term illness or disability in the City of London is 11.8% compared to 17.7% for England. This is considered significantly lower than the national average²⁵.

As mentioned above, it should be noted that this data is not considered entirely representative of the people likely to be affected by the proposed scheme given the large percentage of visitors and commuters regularly travelling to the area, which is likely to be larger than that of the local population. Given that the area is likely to be visited by individuals living outside of the City, due to the area's status as a world class financial centre, it is important to note that approximately one in ten individuals are estimated to be neurodivergent in Greater London (equating to approximately 900,000), and one-tenth of those are possibly autistic²⁶. Further to this, there are over 2 million people in the UK living with sight loss²⁷. With these statistics in mind, it is therefore paramount that the construction of and design of the proposed works considers all users.

Page

98

²⁵ https://www.localhealth.org.uk/#c=report&chapter=c05&report=r01&selgeo1=lalt_2021.E09000001&selgeo2=eng.E92000001

²⁶ https://www.london.gov.uk/questions/2022/1716#:~:text=Andrew%20Boff%20AM%3A%20With%20approximately,900%2C000%20Londoners%20with%20neurodivergent%20conditions

²⁷ <u>https://www.rnib.org.uk/professionals/health-social-care-education-professionals/knowledge-and-research-hub/key-information-and-statistics-on-sight-loss-in-the-uk/ (data is not available at a local scale)</u>

Sensitive receptors

There are several medical facilities in proximity to the proposed scheme which offer services more likely to be used by members of this protected characteristic group. These include:

- One5 Health City Private GP Clinic 300 metres southeast of the proposed scheme
- Broadgate General Practice 360 metres southeast of the proposed scheme
- Barbican Dental Practice 200 metres southwest of the proposed scheme
- City Chiropody and Podiatry Barbican 150 meters west of the proposed scheme
- St Bartholomew's Hospital 500 meters west of the proposed scheme

There are also Boots stores in close proximity to the proposed scheme which provide pharmacy facilities.

What is the proposal's impact on the equalities aim? Look for direct impact but also evidence of disproportionate impact i.e. where a decision affects a protected group more than the general population, including indirect impact

The baseline data shows that there is a low comparative percentage of people with disabilities in the City of London. As illustrated in the section above however, the majority of people likely to be affected by the proposed works are less likely to be residents, therefore it is acknowledged that there may be a larger number of disabled people accessing Moor Lane and the surrounding area than the data suggests. This is likely to be facilitated by the accessibility of the area by public transport, enabling those with limited mobility to access the site and surrounding area given bus and step-free tube/train station provision.

Statistics show that 14% of Londoners currently consider themselves to have a disability that impacts their day-to-day activities 'a little' or 'a lot', and this is expected to rise to 17% by 2030²⁸. Further to this, walking is the main mode of travel for disabled Londoners, with 78% reporting they walk at least once a week. However, 65% of disabled Londoners consider the condition of the pavements to be a barrier to walking more frequently²⁹. It is therefore important that the design considers these requirements, which aligns with the City of London's Transport

What actions can be taken to avoid or mitigate any negative impact or to better advance equality and foster good relations?

Given that the proposals are at the preliminary design stage (See General Arrangement drawing for more details), it is highly recommended that the following is considered to mitigate any negative impact on people with disabilities, when developing the detailed design:

- Dropped Kerbs: In line with the DfT's Inclusive Mobility Guide 2021⁴, it is recommended that appropriate dropped kerbs are provided along the length of Moor Lane to enable easy access for those with disabilities, particularly those using mobility aids.
- Footway Widths: It is advised that the renewed footways are the appropriate width to accommodate any forecasted increase in footfall associated with the redevelopment at 21 Moorfields. This will prevent vulnerable road users, particularly those with disabilities and those reliant on mobility aids¹³, from having to cross the road to avoid congestion and/or step in the carriageway to pass other pedestrians. Appropriate widths will improve the overall user experience and help to support independent travel. It is recommended that the footway widths are

²⁸ <u>https://www.ons.gov.uk/peoplepopulationandcommunity/healthandsocialcare/disability/articles/outcomesfordisabledpeopleintheuk/2021</u>

²⁹ <u>https://www.cityoflondon.gov.uk/assets/Services-Environment/city-of-london-transport-strategy.pdf</u>

Strategy proposal to develop and apply the City of London Street Accessibility Standard (see page 52 of the strategy for more information³).

Research by Transport for All³⁰ has identified some of the key barriers to active travel for those with disabilities, including:

- Pavements cluttered by obstacles are difficult for those with mobility impairments to navigate and can pose a hazard to those with visual impairments. They are also confusing and overwhelming for those who are neurodivergent.
- Pavements that are steep, uneven, or bumpy are difficult to traverse in a wheelchair and can be trip-hazards. Tree roots, cobblestones, and poorly laid paving stones all contribute to this.

Similarly, these findings are echoed by DfT's Inclusive Mobility⁴ guide, whereby a number of barriers to navigating the pedestrian environment were identified, including obstacles, uneven surfaces, crossing the road, navigating slopes and ramps, and lack of confidence to travel. The guidance also underlines that good, inclusive design benefits all users, including those who have non-visible disabilities.

In line with the Department for Transport's Inclusive Mobility Guide 2021 guidance⁴, it is recommended that tactile paving is in place to aid visually impaired people. This is particularly important to consider given that the Royal National Institute of Blind People (RNIB) report that walking is the main mode of travel for blind and partially sighted people, many of whom will have fewer transport options available to them than others³¹. It is understood that new tactile paving would be implemented at the crossing points along Moor Lane and these designs would be in line with the City of London's Standard Details (See Appendix B), fulfilling these requirements.

The proposed footway and public realm improvements associated with the development should help to tackle some of these key barriers, however the General Arrangement drawing does not provide enough detail on the following elements of the works to ensure accessibility for all users:

designed in conjunction with TfL's Pedestrian Comfort Guidance Technical guide (See Appendix B⁶).

- Bollards: It is understood that the bollards proposed on the eastern footway along the development boundary are to act as a Vehicle Security Barrier (VSB). If so, these should be placed at a maximum of 1.2 metres apart to enable passage of wheelchair and mobility scooter users, whilst providing adequate protection for pedestrians. Bollards should also have tonal/colour contrasted tops and potentially some 'guidance path surfaces' to ensure they are visible and detectable. These recommendations also align with DfT guidance⁴ and Guidance on the Use of Tactile Paving Surfaces⁵. In addition to this, it is understood that the exiting bollards at the southern end of Moor Lane, near the Fore Street junction, will be retained, which should already be placed at a maximum of 1.2 meters apart, however the location of the bollards and the proposed 'Rain Garden' will need to be considered to maintain sufficient footway widths and to avoid street clutter and pinch points.
- Greening: It is recommended that the height of the planters and associated • plants, including the species, are considered so to ensure that pedestrians are visible to motorists at all times. This is particularly important at the northern and southern ends of Moor Lane, where the 'Rain Gardens' are located, and where the majority of pedestrian crossing activity is likely to take place (particularly at the northern end where the zebra crossing is located). As above, the positioning of street trees and planters, combined with the aforementioned bollards on the eastern footway will need to be considered to maintain sufficient widths and avoid street clutter and pinch points. In addition to this, consideration should also be given to the tree species, selecting those with minimal leaf shedding to avoid a slippery footway. Street maintenance could also be procured to carry out appropriate clearing during the Autumn. The addition of seating at the edge of planters and/or 'Rain Gardens' could also be considered to capitalise on could also be considered to capitalise on the public realm improvements and shading associated with the greening, and to provide a place to rest for those with limited mobility and stamina.

³¹ Travel, transport and mobility | RNIB

³⁰ <u>https://www.transportforall.org.uk/campaigns-and-research/pave-the-way/</u>

- Footway widths on both the eastern and western sides of Moor Lane
- The direction of drop kerbs. It is necessary to ensure drop kerbs provide the quickest route across the road to reduce conflict with road vehicles, and that they are positioned appropriately to ensure that visually impaired users are being directed to the footway, rather than into the carriageway
- Distances between the proposed bollards on the eastern footway, as well as distance between cycle parking stands and planters
- Details regarding type of cycle parking stands
- Tree planting and covers on Moor Lane
- Details regarding kerb arrangements adjacent to the disabled bays

Although not under the current proposals, the shared use facility at the southern end of Moor Lane, where Moor Lane meets Fore Street, could be of concern to some disabled users who find shared space between pedestrians and cyclists unsafe.³² The flush kerb at this location is also lacking tactile paving, which poses a road safety concern for some disabled groups, particularly those who are visually impaired.

(Recommendations have been provided to address each of these elements in the adjacent section).

In terms of sensitive receptors, there are medical facilities within 500 metres of the proposed works which may be used by disabled people. Following construction, users of the local medical centres are likely to benefit from the improved pedestrian environment on their journey's to and from these facilities.

Construction:

During the construction stage, people with disabilities travelling to health centres or pharmacies in the area may also be affected on their journeys if the appropriate footway diversions are not in place during construction. During construction they may need to use a different route. This should be clearly outlined.

- Cycle Parking: It is recommended that the current short stay cycle parking on Moor Lane considers providing stands that can accommodate cargo bikes, tandems, tricycles and side-by-side cycles, to encourage users of all abilities to visit the site by bike⁴. Adequate lighting should be provided also to improve security (see below for more details) and ensure the stands are well lit as they are currently located next to an entrance to an underground private car park, which could encourage bike theft. CCTV can also be considered to improve security.
- Lighting: The proposals include upgrading and minor adjustments to the existing lighting on the western footway in line with the Public Realm and Lighting Design Guideline² to accommodate the proposed greening. Full details on the upgrades/adjustments are not included in the General Arrangement, however it is recommended that Moor Lane is lit appropriately to prevent any anti-social behaviour, improve user safety for groups vulnerable to crime and further aid visually impaired members of the public. It is recommended that streetlights and signs should be mounted on walls or buildings whenever possible; if not, then placing them at the back of the footway as near the property line as possible is acceptable. In this position, the maximum distance from the property line to the outer edge of the pole should be at least 450mm away from the edge of the carriageway⁴.
- Footway maintenance: The proposed Yorkstone paving along Moor Lane may require maintenance. The roots of planters and trees along the street will need to be monitored to ensure roots do not push up the pavement. This is important because uneven and/or gaps between setts, can cause issues for some users, including those who are vision impaired, wheelchair users, and those using crutches and sticks⁴.
- Shared use: Although outside the scope of this review, it is recommended that a review of shared use at the southern end of Moor Lane is undertaken to determine if this is suitable at this location and to identify

³² <u>https://www.transportforall.org.uk/news/victory-department-for-transport-calls-for-shared-space-roads-to-be-halted-in-the-uk/</u>

Building on this, several potential negative impacts on people with disabilities have

between pedestrians and cyclists. been identified if the appropriate measures are not in place during the construction phase²¹. These include: • Wheelchair and mobility aid users may find it difficult to utilise the Construction: A CEMP or CLP should be implemented to minimise construction impacts²². It should include measures such as suitable temporary ramps diversion routes with appropriate signage for any required footway • Those who are considered sensitive to changes in visual stimuli may find closures, as well as noise mitigation. Continued liaison with stakeholders the diversions difficult to navigate Construction noise can negatively affect people with autism should also be undertaken to inform the plans. On completion of the ٠ works, the develop could also offer a guide to familiarise the changes to Altered public realm and closures can be confusing to those with visual ٠ those who are visually impaired. impairments who are familiar with the area Construction can also generate additional dust and pollutants which • negatively impact people with respiratory or long-term illnesses Road Safety Audit: A Stage 3 Road Safety Audit should also be completed on completion of the works to ensure that the improvements are accessible i.e., ensuring sufficient dropped kerbs and flush surfaces. Summary: It is likely that disability would be the protected characteristic group most affected by the proposals. Once construction is complete, the improved pedestrian environment and public realm would provide substantial benefits to disabled people. With regards to construction, it is recommended that any negative impact on access for those with disabilities is offset by ensuring that suitable, clear diversions with ramps and appropriate signage are provided. See adjacent section for further details. The 2021 Census identified that for the City of London's population: **Key borough statistics:** Day-to-day activities can be limited by disability or long-term illness. In the City of • 3.9% had a disability that limited their day-to-day activities a lot London as a whole, 88% of the residents feel they have no limitations in their • 7.9% had a disability that limited their day-to-day activities a little activities – this is higher than both in England and Wales (82%) and Greater London Source: 2021 Census: Disability, England and Wales - Office for National Statistics (86%). (ons.gov.uk) Measures on self-reported health were also collected during the 2021 census for the City of London borough. The responses were categorised into Very Bad, Bad, Fair, Good and Very Good health. • 0.7% of the population of The City self-reported as having Very Bad health

- a 0.1% decrease from the 2011 census

any accessibility and/or road safety concerns associated with interactions

Pregnancy and Maternity

Check this box if NOT applicable

Pregnancy and Maternity – Additional Equalities Data (Service Level or Corporate) Include data analysis of the impact of the proposals

ONS Conception Statistics, England, and Wales, 2020 provides conception numbers for the City of London. Note these numbers have been combined with the London Borough of Hackney to preserve confidentiality. There were 5,659 conceptions in Hackney and the City of London in 2020. This equates to a conception rate per 1,000 women aged 15 to 44 years of 74.6%. This is slightly higher than the average for Inner London (66.1%) and lower than the average for London as a whole (76.2%). ³³

There were 60 live births in the City of London in 2021. The Total Fertility Rate (TFR) in the City was 1.74. This is the average number of live children that women in the group could bare if they experienced age specific fertility rate of the calendar year throughout their childbearing lifespan. This is higher than the average for Inner London (1.28) and also for London as a whole (1.52)³⁴.

As mentioned above, it should be noted that this data is not considered representative of the majority of the people likely to be affected by the proposed scheme given the large percentage of commuters regularly travelling to the area, and more specifically the development, rather than residents. The scheme is located near the high-density Barbican Estate, although this makes up a population of 4,000 people compared to over 500,000 visiting the city every day. Furthermore, the Barbican Centre hosts events which may encourage people with young children to visit.

Sensitive receptors

Facilities providing services for sensitive receptors in proximity to the proposed scheme which are most relevant to pregnancy and maternity are the same as those for disability.

What is the proposal's impact on the equalities aim? Look for direct impact but also evidence of disproportionate impact i.e. where a decision affects a protected group more than the general population, including indirect impact	What actions can be taken to avoid or mitigate any negative impact or to better advance equality and foster good relations?
Pregnant women are known to have restricted mobility due to their pregnancy. The proposed works will provide safety and accessibility benefits to this group in a	Given that the proposals are at the preliminary design stage (See General Arrangement drawing for more details), it is highly recommended that the

³³ https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/conceptionandfertilityrates/datasets/conceptionstatisticsenglandandwalesreferencetables).

³⁴ Births in England and Wales: summary tables – Office for National Statistics (ons.gov.uk)

Version Control Version:1.1

similar way to those mentioned for the above protected characteristics. Parents with younger children and pushchairs could also benefit from the improvements to the public realm during maternity, as the proposed works would improve the overall pedestrian environment and accessibility, particularly on the eastern side of the footway which is currently closed to pedestrians.

It should be noted however, that the placement and positioning of bollards and trees on the eastern side of the footway could narrow the footway and could therefore impact accessibility, particularly for those travelling with pushchairs and young children.

In terms of sensitive receptors, there are medical facilities within 500 metres of the proposed works which may be used by pregnant women or those caring for young children. Users of these facilities will benefit from the improved pedestrian environment on their journey's to and from these facilities.

Construction:

It is assumed that the proposed works on the eastern side of the footway will be undertaken within the existing hoarding boundaries, however as shown in Figure 2 above, there are insufficient diversions in place to protect pedestrians, particularly more vulnerable road users including pregnant women and women travelling with pushchairs.

Further to this, pregnant women travelling to health centres or pharmacies in the area may also be affected on their journeys if the appropriate footway diversions are not in place during construction on both the eastern and western sides of the footways.

Building on this, several potential negative impacts on pregnant women and those using pushchairs have been identified if the appropriate measures are not in place during the construction phase¹⁹. These include:

- Pushchair users may find it difficult to utilise the temporary ramps
- Construction can also generate additional dust and pollutants which negatively impact pregnant women and their babies.

following is considered to mitigate any negative impact on pregnant women and women with young children when developing the detailed design:

- Footway Widths: It is advised that the renewed footways are the appropriate width to accommodate the subsequent increase in trip generation and footfall associated with the new development at 21 Moorfields. This will prevent vulnerable road users as well as those using pushchairs, from having to step in the carriageway to pass other pedestrians. It is recommended that the footway widths are designed in conjunction with TfL's Pedestrian Comfort Guidance Technical guide (See Appendix B⁶).
- Lighting and CCTV: Pregnant women and those with push chairs can feel especially vulnerable in places with limited surveillance and low lighting. It is therefore recommended that sufficient levels of lighting should be included in the design along Moor Lane, particularly at the entrances to the access roads on both sides of the footway. CCTV can also be considered to improve safety.
- Trees and Planters: It is recommended that the location and arrangement of the proposed trees are developed in consultation with landscape architects and the designs align with existing guiding principles. This will help to prevent street clutter, ensure visibility, and avoid impeding informal crossing points³⁵. They should not block the footway giving adequate risk for a passing buggy. Consideration should also be given to the tree species, selecting those with minimal leaf shedding to avoid a slippery footway. Street maintenance could also be procured to carry out appropriate clearing during the Autumn. Planters can provide an area to sit, as pregnant people, and those who have just given birth may need to rest often.
- Maintenance of Paving: The Yorkstone paving along Moor Lane will need to be well maintained. The roots of planters and trees along the street will need to be monitored to ensure roots do not push up the pavement. This is important because uneven and/or gaps between setts can cause issues for pushchairs.

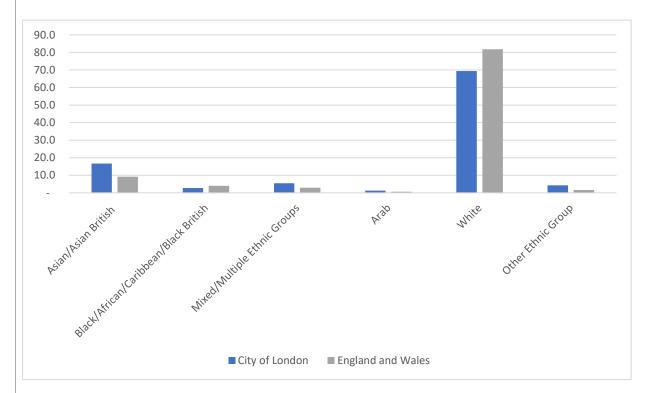
³⁵ <u>https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1072722/Essex_Manual_for_Streets_Redacted.pdf</u>
<u>Version Control</u> Version:1.1
Author: Marie Gallagher

Summary: Pregnant women may be negatively affected during the construction phase and without sufficient lighting incorporated into the design, however, the potential adverse impacts would be sufficiently managed through implementation of suitable design measures discussed in the adjacent actions section.	 Construction: A CEMP or CLP should be implemented to minimise construction impacts²². It should include measures such as suitable diversion routes with appropriate signage for any required footway closures. Continued liaison with stakeholders should also be undertaken to inform the plans. Road Safety Audit: A Stage 3 Road Safety Audit should also be completed on completion of the works to ensure that the improvements are accessible i.e., ensuring sufficient dropped kerbs and flush surfaces.
 Key borough statistics: There were 5,659 conceptions in Hackney and The City in 2020. This equates to a conception rate per 1,000 women aged 15 to 44 years of 74.6%. This is slightly higher than the average for Inner London (66.1%) and lower than the average for London as a whole (76.2%)³³. 	 There were 60 live births in The City of London in 2021. The Total Fertility Rate (TFR) in the City was 1.74. This is higher than the average for Inner London (1.28) and also for London as a whole (1.52)³⁴.

Race - Additional Equalities Data (Service Level or Corporate) Include data analysis of the impact of the proposals

Figure 7 shows the ethnic group breakdown for the City of London as per the 2021 Census. It clearly shows that the majority of the population is White (69.4%), with the second largest ethnic group classed as Asian/Asian British (16.7%). The proportion of the population from Mixed/multiple ethnic groups, Black/African/Caribbean/Black British, Other ethnic groups and Arab are similar (5.5%, 2.7%, 4.3% and 1.3% respectively).

Figure 7: City of London Population by Ethnic Group (Source: Census 2021)



The White and Black populations are lower than the national averages for England, with differences of 12.4% and 1.3% respectively. The other ethnic group categories are higher than the national averages, with the greatest difference occurring for the Asian population which is 7.5% higher³⁶.

Version Control Version:1.1

Author: Marie Gallagher

³⁶ <u>https://www.nomisweb.co.uk/sources/census</u> 2011 ks/report?compare=E09000001

It should be noted that this data is not considered entirely representative of all the people likely to be affected by the proposed scheme given that users are likely to be a combination of residents, particularly of the Barbican Estate, commuters, and visitors.

Sensitive receptors

There are no sensitive receptors in proximity to the proposed scheme which are of specific relevance to race.

What is the proposal's impact on the equalities aim? Look for direct impact but also evidence of disproportionate impact i.e. where a decision affects a protected group more than the general population, including indirect impact	What actions can be taken to avoid or mitigate any negative impact or to better advance equality and foster good relations?
There is no clear evidence, data, or rationale that the proposed works would have a disproportionate effect on groups based on race as a protected characteristic. It is acknowledged however that some groups are more at risk of hate crimes than others if the security measures associated with the proposed works are insufficient.	Given that the proposals are at the preliminary design stage (See General Arrangement drawing for more details), it is highly recommended that the following is considered to mitigate any negative impact on different racial groups, when developing the detailed design:
Summary: The potential adverse impact would be sufficiently managed through implementation of suitable design measures discussed in the adjacent actions section.	 Lighting and CCTV: Sufficient levels of lighting should be included in the design along Moor Lane, particularly at the entrances to the access roads on both sides of the footway, to further improve safety of users and to account for any blind spots. This is particularly important given that some groups are more at risk of hate crimes than others, therefore such measures could help to deter anti-social behaviour such as hate crimes. CCTV can also be considered to improve safety.
Key borough statistics: Our resident population is predominantly white. The largest minority ethnic groups of children and young people in the area are Asian/Bangladeshi and Mixed – Asian and White.	The second largest ethnic group in the resident population is Asian, which totals 16.7% - this group is fairly evenly divided between Asian/Indian at 3.7%; Asian/Bangladeshi at 3.3%; Asian/Chinese at 6.3% and Asian/Other at 3%. Asian / Pakistani only accounts for 0.4%.
Version Control Version:1.1	Last undated: 08/05/2022

The City has a relatively small Black population, less than London and England and
Wales. Children and young people from minority ethnic groups account for 41.71%
of all children living in the area, compared with 21.11% nationally.The City
authori
London

The City of London has the highest percentage of Chinese people of any local authority in London and the second highest in England and Wales. The City of London has a relatively small Black population comprising 2.7% of residents. This is considerably lower than the Greater London wide percentage of 13.3% and also smaller than the percentage for England and Wales of 3.3%.

See ONS Census information.

Religion or Belief

Check this box if NOT applicable

Religion or Belief - Additional Equalities Data (Service Level or Corporate) Include data analysis of the impact of the proposals

Census 2021 data shows the percentages of the population in the City of London who identify as a particular religion. They are as follows:

- No religion: 43.8%
- Christian: 34.7%;
- Religion not stated: 8.9%;
- Muslim: 6.3%
- Jewish: 2.1%;
- Hindu: 2.6%;
- Buddhist: 1.1%;
- Other religion: 0.4%; and
- Sikh: 0.1%.

The majority of the population identify as non-religious. The second highest proportion of the population identify as having no religion, and the third highest proportion of the population have not stated a religion. This differs with the averages for England and Wales (Christian: 46.2%, No religion: 37.2% and Religion not stated: 6%). As determined by the Annual Population Survey, the employment rate by religion estimates for 2018 show the percentage of the population in England identifying as having no religion to have the highest employment rate at 77.3%, followed by those who identify as Hindu at 76.2% and then those identifying as Christian at 76%.³⁷

It should be noted however that this data is not considered entirely representative of all the people likely to be affected by the proposed scheme given that users are likely to be a combination of residents, particularly of the Barbican Estate, commuters, and visitors.

Sensitive receptors

There are several places of worship in the surrounding area of the proposed scheme servicing members of this protected characteristic group. Those in closest proximity are as follows:

Version Control Version:1.1

Author: Marie Gallagher

Last updated: 08/05/2023 Date of next review:

³⁷ https://www.ons.gov.uk/peoplepopulationandcommunity/culturalidentity/religion/datasets/religioneducationandworkinenglandandwales

•

•

St Giles Cripplegate – 200 metres from the site

St Lawrence Jewry Church – 380 metres from the site

• Roman Catholic Church of St Joseph – 480 metres from the site

 Trinity Church Central London – 480 metres from the site St Margaret's Church London – 500 metres from the site 	
What is the proposal's impact on the equalities aim? Look for direct impact but also evidence of disproportionate impact i.e. where a decision affects a protected group more than the general population, including indirect impact	What actions can be taken to avoid or mitigate any negative impact or to better advance equality and foster good relations?
There is no clear evidence, data, or rationale that the proposed works would have a disproportionate effect on groups based on religion or belief as a protected characteristic. It is acknowledged however that some groups are more at risk of hate crimes than others if the security measures associated with the proposed works are insufficient.	Given that the proposals are at the preliminary design stage (see General Arrangement drawing for more details), it is highly recommended that the following is considered to mitigate any negative impact on religion or belief as a protected characteristic, when developing the detailed design:
Construction: Noise associated with the construction of the works could have a negative impact on places of worship during services and religious holidays. Summary: The potential adverse operational impact would be sufficiently managed through implementation of suitable design measures discussed in the adjacent actions section.	 Lighting and CCTV: Sufficient levels of lighting should be included in the design along Moor Lane, particularly at the entrances to the access roads on both sides of the footway, to further improve safety of users and to account for any blind spots. This is particularly important given that some groups are more at risk of hate crimes than others, therefore such measures could help to deter anti-social behaviour such as hate crimes. CCTV can also be considered to improve safety. In addition to this, places of worship located near to the site should be included in the stakeholder list and be informed of any out of hours works, allowing consideration of service times and religious holiday's during the construction phase.
Key borough statistics – sources include:The ONS website has a number of data collections on religion and belief, groupedunder the theme of religion and identity.Religion, England and Wales - Office for National Statistics (ons.gov.uk)	

Sex

Sex – Additional Equalities Data (Service Level or Corporate) *Include data analysis of the impact of the proposals*

The Census 2021 reported that males comprised 55.5% of the population in the City of London, whereas females comprised 44.5%. This contrasts with the national average which shows males comprising 49% of the population and females 51%, as well as the London average which shows males comprising 49.3% of the population and females 50%. For the same year, the gender split for the London region was estimated at 50.1% for males and 49.9% for females.

It should be noted that this data is not considered entirely representative of all the people likely to be affected by the proposed scheme given that users are likely to be a combination of residents, particularly of the Barbican Estate, commuters, and visitors.

What is the proposal's impact on the equalities aim? Look for direct impact but also evidence of disproportionate impact i.e. where a decision affects a protected group more than the general population, including indirect impact

There is the potential that insufficient lighting along Moor Lane could affect women in terms of their personal safety. Improving lighting is particularly important given that one in two women feel unsafe walking along after dark in a busy public space, compared to one in five men³⁸.

Summary:

The potential adverse impact would be sufficiently managed through implementation of suitable design measures discussed in the adjacent actions section.

What actions can be taken to avoid or mitigate any negative impact or to better advance equality and foster good relations?

Given that the proposals are at the preliminary design stage (See General Arrangement drawing for more details), it is highly recommended that the following is considered to mitigate any negative impact on women when developing the detailed design:

- Lighting and CCTV: Sufficient levels of lighting should be included in the design along Moor Lane, particularly at the entrances to the access roads on both sides of the footway, to further improve safety of users and to account for any blind spots. This is particularly important given that some groups are more at risk of hate crimes than others, therefore such measures could help to deter anti-social behaviour such as hate crimes. CCTV can also be considered to improve safety.
- Greening: Trees and planters should be well maintained as to not block the view of the street or facilitate hiding spaces and blind spots for people to lurk. In addition to this, the planters and 'Rain Gardens' could

³⁸ <u>https://www.endviolenceagainstwomen.org.uk/new-data-women-feel-unsafe-at-night/</u>

	be complemented by seating, making Moor Lane more of a destination rather than a throughfare, and therefore improve levels of natural surveillance. This could be particularly beneficial for women who are more likely than men to make journeys outside peak times and undertake extra unpaid caring responsibilities and are therefore likely to travel with people with other associated protected characteristics.
Key borough statistics:	A number of demographics and projections for demographics can be found on the
At the time of the 2021 Census (Sex - Office for National Statistics (ons.gov.uk)	Greater London Authority website in the London DataStore. The site details
population of the City of London could be broken into could be broken up into:	statistics for the City of London and other London authorities at a ward level:
• 4722 males (55.5%)	Population projections
• 3,816 females (44.5%)	NB: These statistics provide general data for these protected characteristics. You need to ensure you have sufficient data about those affected by the proposal.

Sexual Orientation and Gender Reassignment

Check this box if NOT applicable

Sexual Orientation and Gender Reassignment - Additional Equalities Data (Service Level or Corporate) Include data analysis of the impact of the proposals

ONS 2021 survey data displays a self-perceived sexual identity overview for London's population and more specifically the City of London's population, as follows:

London:

- Heterosexual: 86.2%
- Gay or Lesbian: 2.2%
- Bisexual: 1.5%
- Pansexual: 0.4%
- Asexual: 0%
- Queer: 0.1%
- All other sexual orientations: 0%
- Not answered: 9.5%

City of London:

• Heterosexual: 79.3%

Version Control Version:1.1 Author: Marie Gallagher Last updated: 08/05/2023 Date of next review:

- Gay or Lesbian: 7.6%
- Bisexual: 2.3%
- Pansexual: 0.3%
- Asexual: 0.1%
- Queer: 0.1%
- All other sexual orientations: 0%
- Not answered: 10.4%

The data shows that the City of London has a slightly lower percentage of people who identify as heterosexual than London as a whole, 79.3% compared to 85.2% respectively. Conversely, the City of London has a higher percentage of people who identify as Gay or Lesbian, at 7.6% compared to 2.2% for London. This is a similar trend for those identifying as Bisexual; 1.5% for London, compared to 2.3% for the City of London.

Sensitive receptors

There are no facilities providing services to sensitive receptors in proximity to the proposed scheme which are of specific relevance to sexual orientation.

What is the proposal's impact on the equalities aim? Look for direct impact but also evidence of disproportionate impact i.e. where a decision affects a protected group more than the general population, including indirect impact	What actions can be taken to avoid or mitigate any negative impact or to better advance equality and foster good relations?
There is the potential that insufficient lighting could disproportionately affect people based on their sexual orientation and gender reassignment, in terms of their personal safety. Summary: The potential adverse impact would be sufficiently managed through implementation of suitable design measures discussed in the adjacent actions section.	 Given that the proposals are at the preliminary design stage (See General Arrangement drawing for more details), it is highly recommended that the following is considered to mitigate any negative impact on individuals based on their sexual orientation and/or gender reassignment when developing the detailed design: Lighting and CCTV: Sufficient levels of lighting should be included in the design along Moor Lane to further improve safety of users and to account for any blind spots. This is particularly important given that some groups are more at risk of hate crimes than others, therefore such measures could help to deter anti-social behaviour such as hate crimes. CCTV can also be considered to improve safety. Trees and Planters: These should be maintained in such a way that they do not create blind spots where people can lurk out of sight.
Key borough statistics:	

Marriage and Civil Partnership

Check this box if NOT applicable

Marriage and Civil Partnership - Additional Equalities Data (Service Level or Corporate) Include data analysis of the impact of the proposals

The marriage and civil partnership profile for the City of London borough as reported in the 2021 Census is as follows:

- Single: 48.33%;
- Married: 35.1%;
- Divorced or formerly in a same-sex civil partnership which is now legally dissolved: 7.8%;
- Widowed or surviving partner from a same-sex civil partnership: 4.69%;
- Separated: 2.38%; and
- In a registered same-sex civil partnership: 1.7%.

The percentage of the population who fall within the Single and Married categories differ from the averages for England, where 37.9% are single and 46.9% are married. This shows the City of London to have a significantly higher number of single people, which aligns with the lower number of people who are married. The other four categories follow the national averages closer, with the differences between the City of London and England being much smaller as follows:

- Divorced or formerly in a same-sex civil partnership which is now legally dissolved: 0.4% lower;
- Widowed or surviving partner from a same-sex civil partnership: 1.4% lower;
- Separated: 0.1% lower; and
- In a registered same-sex civil partnership: 1.5% higher.

It should be noted that this data is not considered entirely representative of all the people likely to be affected by the proposed scheme given that users are likely to be a combination of residents, particularly of the Barbican Estate, commuters, and visitors.

What is the proposal's impact on the equalities aim? Look for direct impact but also evidence of disproportionate impact i.e. where a decision affects a protected group more than the general population, including indirect impact	What actions can be taken to avoid or mitigate any negative impact or to better advance equality and foster good relations?
There is no clear evidence, data, or rationale that the proposed works would have a disproportionate effect on marriage and civil partnership.	No actions or measures proposed.
Key borough statistics – sources include:	

Additional Impacts on Advancing Equality and Fostering Good Relations Check this box if NOT applicable

Additional Equalities Data (Service Level or Corporate)

Click or tap here to enter text.

Are there any additional benefits or risks of the proposals on advancing equality and fostering good relations not considered above?

Click or tap here to enter text.

What actions can be taken to avoid or mitigate any negative impact on advancing equality or fostering good relations not considered above? Provide details of how effective the mitigation will be and how it will be monitored.

Click or tap here to enter text.

This section seeks to identify what additional steps can be taken to promote these aims or to mitigate any adverse impact. Analysis should be based on the data you have collected above for the protected characteristics covered by these aims.

In addition to the sources of the information highlighted above – you may also want to consider using:

- Equality monitoring data in relation to take-up and satisfaction of the service
- Equality related employment data where relevant
- Generic or targeted consultation results or research that is available locally, London-wide or nationally
- Complaints and feedback from different groups.

Additional Impacts on Social Mobility

Check this box if NOT applicable

Additional Social Mobility Data (Service level or Corporate)

Click or tap here to enter text.

Are there any additional benefits or risks of the proposals on advancing Social Mobility?

Click or tap here to enter text.

What actions can be taken to avoid or mitigate any negative impact on advancing Social Mobility not considered above?

Provide details of how effective the mitigation will be and how it will be monitored.

Click or tap here to enter text.

This section seeks to identify what additional steps can be taken to promote the aims or to mitigate any adverse impact on social mobility. This is a voluntary requirement (agreed as policy by the Corporation) and does not have the statutory obligation relating to protected characteristics contained in the Equalities Act 2010.

Analysis should be based on the data you have available on social mobility and the access of all groups to employment and other opportunities. In addition to the sources of information highlighted above – you may also want to consider using:

- Social Mobility employment data
- Generic or targeted social mobility consultation results or research that is available locally, London-wide or nationally
- Information arising from the Social Mobility Strategy/Action Plan and the Corporation's annual submissions to the Social Mobility Ind

Conclusion and Reporting Guidance

Set out your conclusions below using the EA of the protected characteristics and submit to your Director for approval.	Review your EA and action plan as necessary through the development and at the end of your proposal/project and beyond.
If you have identified any negative impacts, please attach your action plan to the EA which addresses any negative impacts identified when submitting for approval.	Retain your EA as it may be requested by Members or as an FOI request. As a minimum, refer to any completed EA in background papers on reports, but also include any appropriate references to the EA in the body of the report or as an
If you have identified any positive impacts for any equality groups, please explain how these are in line with the equality aims.	appendix.

This analysis has concluded that ...

It is anticipated that the once complete, the proposed works will provide benefits for protected characteristics including improved accessibility and comfort levels. These improvements would be enjoyed by all users and are likely to particularly benefit groups with protected characteristics related to age and disability.

As detailed throughout the assessment, there are opportunities for enhancement and impact mitigation during the construction phase, which are discussed in Section 2: Recommendations. Further to this, the designs are assessed using the City of London Street Accessibility Tool which has been developed in consultation with key accessibility groups. In line with the City of London's existing practices, it is advised that the final detailed design is assessed by the borough's in-house accessibility expert. Given the level of intervention, it is advised that this level of consultation is sufficient.

Outcome of analysis – check the one that applies

🗆 Outcome 1

No change required where the assessment has not identified any potential for discrimination or adverse impact and all opportunities to advance equality have been taken.

Outcome 2

Adjustments to remove barriers identified by the assessment or to better advance equality. Are you satisfied that the proposed adjustment will remove the barriers identified.

Outcome 3

Continue despite having identified some potential adverse impacts or missed opportunities to advance equality. In this case, the justification should be included in the assessment and should be in line with the duty to have 'due regard'. For the most important relevant policies, compelling reasons will be needed. You should consider whether there are sufficient plans to reduce the negative impact and/or plans to monitor the actual impact.

Outcome 4

Stop and rethink when an assessment shows actual or potential unlawful discrimination.

Signed off by Director: *Click or tap here to enter text.*

Name: Click or tap here to enter text.

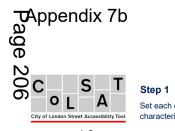
Date *Click or tap to enter a date.*

Appendix 7b

Page 205

City of London Streets Accessibility Assessment





Moor Lane section 1 - existing layout

COLSA T	Step 1 Set each of the drop downs below to best describe the street characteristics for the section being analysed	Step 2 Review t		for each nee	eds segmen			er the box ne		score to read	l quotes exp	laining how	participants	in
v 1.2		EWC	O1 MWC	MS	<u>ТА</u> wa		LC	GD	RS	× HI	ANI	CCO AT	DI	Comments
Crossing Point														
Crossing Type	Uncontrolled crossing > 8m road width	3	2	3	1	2	0	2	2	3	1	2	1	~9.6m - uncontrolled crossing at Moor Lane junction with Fore Street. Carriageway level with footway. No protected space for cyclists. Mixed traffic. Note that there is shared use north of this section which merges
Crosses Over	Carriageway (motor vehicles and cycles together)	3	3	3	3	3	3	3	3	3	3	3	4	into mixed traffic. Partial width only. Some sections where the carriageway is flush with the footway does not have
Edge Marking Tactie Paving Back Edge Tactie Paving Colour	800 mm deep tactile paving edge marking (partial width) Straight back edge Tactile colour as per guidance (red at contr. buff at uncontr.)	3 2 3	3 3 3	3 3 3	3 3 3	3 1 3	1 4 3	2 3 3	3 3 3	3 2 3	3 2 3	3 4 3	4 4 3	tactiles.
Tactile Paving Tonal Contrast Tactile Paving Stem Length	Tacile without significant contrast with surounding paving Tactile stem within 0.5 m of building line	3 3	3 3	3 3	3 3	3 1	3 4	2 3	2 3	2 3	3 3	3 4	3 3	Tactile paving colour does not contrast enough with york stone paving.
Tactile Paving Stem Width	Tactile stem 800 mm width	3	3	3	3	2	3	3	3	4	4	3	3	No island, however given there is an access restriction on Moor Lane Sat and Sun, as well as Monday to Friday 11pm - 7am (and bank holidays), it's likely that this route is low traffic. This is also an access road
Island Type	No island	2	3	2	2	2	2	2	3	2	2	2	3	therefore counts will be lower.
Island Depth	Island depth > 1.2 m	3	4	3	3	3	3	4	3	4	4	4	3	
Kerb Drop Slope	Kerb drop < 1/12, 4.7deg, 8% incline	3	3		3	3	3	3	3	3	2	3	4	No slope, flush.
Kerb Drop Tactile	Kerb drop with tactile paving	3	2	3	4	1	3	3	3	3	3	4	3	
Signal (red/green man)	Far side signal	3	4	2	4	3	4	4	4	4	4	4	3	
Audible (beeping)	No Audible	3	3	2	2	3	2	3	2	3	2	3	1	
Count Down Tactile Rotating Cone	No count down Rotating cone right side only	2	3 3	3	3 3	3 3	3	3	3	2 3	3	3 3	2	
Surface Material														
Surface Type	Smooth York Stone	3	3	3	3	4	4	4	3	3	4	3	3	Good quality footway.
Pattern Contrast with Road	Uniform paving colour Lower tonal contrast between paving and road	3	3	3	3 3	3	3	3	3 3	3	3	4	3 3	All grey. Grey york stone isn't high contrasting against the grey, asphalt carriageway.
Contrast with Road	Lower tonal contrast between paying and road	3	3	3	3	3	3	2	3	2	3	3	3	Double yellow lines along this section, although slightly
Lines	Yellow/red/white lines at road edge	3	3	4	3	3	3	3	4	3	4	4	4	faded.
Kerb														
Kerb Type (crossing over) Kerb Type (moving alongside)	Crossing upstand 0 mm to 3 mm + 800 tactile paving Deliniating kerb 100 mm to 150 mm	4	3	4	4	2	3 3	4	3 3	3 3	4	3	3 3	Flush with tactiles. Fore Street
Footway Width														
Width	Footway width > 5 m	4	4	4	4	3	2	3	3	4	4	4	4	Footways on Fore Street on approach to Moor Lane are ~2.6m. Width from building line on Moor Lane to uncontrolled crossing is ~6m. Bollards and lamp columns are placed >1.5m apart. Given ample footway space adjacent to the uncontrolled crossing, street furniture does not cause
Unobstructed Width	Min unobstructed width > 1.5 m	3	3	3	3	3	4	3	3	4	3	3	3	pinch points or clutter.
Street Furniture														
Position Cafe Tables Temporary Items	Street furniture < 1 m from building line No cafe tables No temporary obstructions	1 4 4	2 4 4	2 4 4	2 3 4	2 3 4	2 4 4	2 3 4	1 3 4	1 3 4	1 4 4	2 3 4	2 4 4	Lamp columns located adjacent to building line.

Page														
Contrast	Street furniture > 0.9 m height High tonal contrast with paving	3 3	3 3	3	3 3	4	3 3	3	3	3 3	3 3	3 3	3 3	Lamp columns, wayfinding signs and bollards all >0.9m. Black bollards/lamp columns contrast with york stone paving. Benches located within the Barbican Estate, approximately 0.3 miles (480m) away. Additional
Bench Spacing Bench Design Bench Seat Height	Bench > 400 m away Benches with arms + Backrests Benches seat height 45 to 50 cm	3 3 3	3 3 3	3 4 3	1 4 4	0 4 3	3 3 3	3 3 3	2 4 3	2 4 4	1 4 3	2 3 3	3 3 3	approximately 0.3 miles (480m) away. Additional seating is available at the Finsbury Circus Western Arm, also 480m away. Although located in the middle of the City, the seating within the Barbican Centre offers a relaxing, pleasant sensory experience (traffic free, planting, water).
Bench Sensory Experience	No sensory experience	3	3	3	3	3	3	3	3	3	3	3	3	Finsbury Circus is located adjacent to Moorgate, which is a busy through routes and bus routes. Some greening is present within Finsbury Circus Gardens however. (Andrea, I've got for neutral here given that the Barbican centre offers a really nice sensory experience however outside of this, seating in the area is generally located adjacent to busy roads/where there is high footfall)
	No sensory experience	3	3	3	3	3	3	3	3	3	3	3	3	
Slopes Gradient (in direction of travel Camber (across footway)) Gradient < 1/50 Camber < 1/50	3 3	4	4	4 4	3 3	3 3	3 3	4	3 3	4 4	3 3	3	Assumption based on google. Assumption based on google.
Vehicle Access														
Vehicle Crossover Blue Badge Parking Taxi Drop Off Location Taxi Drop Off Kerb Dedicated Taxi Drop Off	No crossover Blue badge parking Within 100 m Taxi drop off within 10 m Taxi drop off kerb > 150 mm Dedicated taxi drop off point / taxi rank	3 4 4 3	3	3 3 3 3 4	3 3 4 3	3 3 4 2 4	3 3 4 3 3 3	3 3 4 3 3	3 3 4 3 4	3	3	3 3 4 3 4	3 3 4 4 4	Two disabled parking bays are present outside Salters' Hall on Fore Street, roughly 60m from the Moor Lane junction with Fore Street. Taxi rank is located 250m from Moor Lane junction with Fore Street (outside 28 Ropemaker Street). Taxis are also permitted to drop off on double yellow lines on Moor Lane. Low height kerb along length of bay.
Bus Stop Location Bus Stop Kerb Height	100 m to 250 m away 125 mm to 140 mm	3	3	2	3	2	3 3	3	3	2	3	3	3	Bus stop located on London Wall is 145m from the Moor Street junction with Fore Street.
Bus Stop Type	Flag only	3	3	2	3	1	3	3	3	1	3	2	2	Note that the bus stop on the southern side of London Wall has shelter and perch seat.
Toilets														
Accessible Toilets	100 m to 500 m away	3	3	3	3	2	3	3	4	3	3	3	4	Accessible toilets are available at EI Vino Alban Gate which is located 0.3 miles (480m) away. Changing Places toilets are available at the Barbican Centre Beech Street, 480m (0.3 mile) from the Moor Lane junction with Fore Street https://www.changing-
Changing Places Toilets	Within 500 m	3	4	3	3	3	3	3	3	3	3	4	4	places.org/find
Published September 2022	The City of London Street Accessibility Tool (CoLSAT) was developed by Ross Atkin Associates and Urban Movement for the City of London Corporation.	R	Ross Atkir Assoc	n ciates									rban ovement	

Page 208 C S T CIty of London Street Accessibility Tool v 1.2

Moor Lane section 1 - proposed layout

C C C C C C C C C C C C C C C C C C C	Set each of the drop downs below to best describe the street characteristics for the section being analysed	Step 2 Review t	he results fo	or each nee	ds segmen		e cursor ove ent are affe			core to read	quotes exp	laining how p	participants	in
v 1.2		EWC	MWC	MS	1 ^C WA		LC	GD	RS	8		AT		Comments
		EWC	WWC	IVIS	VVA	VVI	LC	GD	кə	пі	ANI	AI	DI	Comments
Crossing Point			_		_	_		_	_		_	_	_	
Crossing Type	Uncontrolled crossing > 8m road width	3	2	3	1	2	0	2	2	3	1	2	1	No change from existing arrangement. ~9.6m - uncontrolled crossing at Moor Lane junction with Fo Street. Carriageway level with footway. No change from existing arrangement. No protecte space for cyclists. Mixed traffic. Note that there is shared use north of this section which merges into
Crosses Over	Carriageway (motor vehicles and cycles together)	3	3	3	3	3	3	3	3	3	3	3	4	mixed traffic. Recommendation: consider implication of shared use space for some vulnerable users. No change from existing arrangement. Partial width only. Some sections where the carriageway is flush with the footway does not have tactiles. Recommendation: consider tactiles across full width
Edge Marking Tactie Paving Back Edge Tactie Paving Colour	800 mm deep tactile paving edge marking (partial width) Straight back edge Tactile colour as per guidance (red at contr. buff at uncontr.)	3 2 3	3 3 3	3 3 3	3 3 3	3 1 3	1 4 3	2 3 3	3 3 3	3 2 3	3 2 3	3 4 3	4 4 3	flush kerb. No change from existing arrangement. No change from existing arrangement. No change from existing arrangement. Tactile pavi
Tactile Paving Tonal Contrast	Tacile without significant contrast with surounding paving Tactile stem within 0.5 m of building line	3	3 3	3 3	3 3	3 1	3 4	2 3	2	2 3	3 3	3 4	3 3	colour does not contrast enough with york stone paving.
Island Type	No island	2	3	2	2	2	2	2	3	2	2	2	3	No change from existing arrangement. No island, however given there is an access restriction on Mo Lane Sat and Sun, as well as Monday to Friday 11 7am (and bank holidays), it's likely that this route is traffic. Recommendation: could this route become access only, implementing a 24/hr filter rather than timed restriction? This would reduce conflict betwe- motor vehicles and cycles (this is a cycle route) am remove the need for shared use on the footway, improving road safety for pedestrians.
sland Depth	Island depth > 1.2 m	3	4	3	3	3	3	4	3	4	4	4	3	No slope, flush - assume this is the correct option f
Kerb Drop Slope Kerb Drop Tactile Signal (red/green man) Audible (beeping) Count Down Factile Rotating Cone	Kerb drop < 1/12, 4.7deg, 8% incline Kerb drop with tactile paving Far side signal No Audible No count down Rotating cone right side only	3 3 3 2 3	3 2 4 3 3 3	3 2 2 3 3	3 4 2 3 3	3 1 3 3 3 3	3 3 4 2 3 2	3 3 4 3 3 3	3 3 4 2 3 3	3 3 4 3 2 3	2 3 4 2 3 3 3	3 4 3 3 3	4 3 1 2 3	this? <1/12
Surface Material														
Surface Type Pattern	Smooth York Stone Uniform paving colour	3	3 3	3 3	3 3	4	4	4	3 3	3 3	4	3	3 3	Footway's will be repayed. All grey. No change from existing arrangement. Grey york
Contrast with Road Lines	Lower tonal contrast between paving and road Yellow/red/white lines at road edge	3 3	3 3	3 4	3 3	3 3	3 3	2 3	3	2 3	3	3	3 4	stone isn't high contrasting against the grey, aspha carriageway. Double yellow lines will be repainted.
Kerb														
Kerb Type (crossing over)	Crossing upstand 0 mm to 3 mm + 800 tactile paving	4	3	4	4	2	3	4	3	3	4	3	3	Standard Details 11 (SD 11) suggest granite kerbs be used which will be flush with carriageway. Confin with CoL.

Page														
N Of ootway Width														
Width	Footway width > 5 m	4	4	4	4	3	2	3	3	4	4	4	4	Footways on Fore Street on approach to Moor Street are ~2.6m, which will be increased to accommodate the proposed sheffield cycle parking stands, leaving ~2.6m of unobstructed space for pedestrians. Width from building line to uncontrolled crossing is ~6m which will remain unchanged. No change from existing arrangement. Bollards and lamp columns are placed >1.5m apart. Given ample footway space adjacent to the uncontrolled crossing, street furniture does not cause pinch points or clutter. In addition to this, the footway widening will accommodate the new sheffield stands, maintaining
	Min unobstructed width > 1.5 m	3	3	3	3	3	4	3	3	4	3	3	3	ample space for pedestrians.
Cafe Tables	Street furniture < 1 m from building line No cafe tables	1	2	2	2	2	2	2	1	1	1	2	2	Lamp columns located adjacent to building line. These will remain unchanged.
Street Furniture Height	No temporary obstructions Street furniture > 0.9 m height	3	3	3	3	4	3	3	3	3	3	3	3	Lamp columns, wayfinding signs and bollards all >0.9m. Recommendation: sheffield stands should also be >0.9m in height. It is also recommended that the type of cycle stands should be considered to include provision that can accommodate cargo bikes, tandems, tricycles, and side-by-side cycles. This could help to encourage users of all abilities to visit the site and surrounding area by bike. No change from existing arrangement. Black bollards/lamp columns contrast with york stone paving. Some of the bollards at the uncontrolled crossing have been retrofitted with bright colours,
Bench Spacing	High tonal contrast with paving Bench > 400 m away Benches with arms + Backrests	3	3 3 3	3	1	3	3 3 3	333	2	2	1	3	3 3 3	improving their visibility further. No proposals for additional seating. Recommendation: the addition of seating at the edge of the planters/and or rain gardens could also be considered to capitalise on the public realm improvements and shading assocoiated with the greening. Benches located within the Barbican Estate, approximately 0.3 miles (480m) away. Additional seating is available at the Finsbury Circus Western Arm, also 480m away.
Bench Seat Height	Benches seat height 45 to 50 cm	3	3	3	4	3	3	3	3	4	3	3	3	Although located in the middle of the City, the seating within the Barbican Centre offers a relaxing, pleasant sensory experience (traffic free, planting, water). Finsbury Circus is located adjacent to Moorgate, which is a busy through routes and bus routes. Some greening is present within Finsbury Circus Gardens however. (Andrea, I've got for neutral here given that the Barbican centre offers a really nice sensory experience however outside of this, seating in the area is generally located adjacent to busy roads/where
	No sensory experience	3	3	3	3	3	3	3	3	3	3	3	3	there is high footfall)
Slopes Gradient (in direction of travel) Camber (across footway)	Gradient < 1/50 Camber < 1/50	3	4	4	4	3	3	3	4	3	4	3	3	Assumption based on google. Assumption based on google.
Vehicle Access	Camber > 1/50	3	4	3	4	3	3	3	3	3	4	3	4	nasampuon based on google.
	No crossover	3	3	3	3	3	3	3	3	3	3	3	3	1

Page 21														Two disabled parking bays are proposed 60m north of the Moor Lane junction with Fore Street.
Blue Badge Parking Taxi Drop Off Location Taxi Drop Off Kerb Dedicated Taxi Drop Off Bus Stop Location Bus Stop Location Bus Stop Kerb Height	Blue badge parking Within 100 m Taxi drop off within 10 m Taxi drop off kerb > 150 mm Dedicated taxi drop off point / taxi rank 100 m to 250 m away 125 mm to 140 mm	4 4 3 3 3	3 4 4 3 3 4	3 3 4 2 3	3 4 3 4 3 4	3 4 2 4 2 4	3 4 3 3 3 3	3 4 3 3 3 3 3	3 4 3 4 3 3	3 4 3 2 3	3 4 4 4 3 4	3 4 3 4 3 3 3	3 4 4 3 3	Two disabled parking bays are present outside Salters' Hall on Fore Street, roughly 60m from the Moor Lane junction with Fore Street. No additional provision proposed. Taxi rank is located 250m from Moor Lane junction with Fore Street (outside 28 Ropemaker Street). Taxis are also permitted to drop off on double yellow lines on Moor Lane. No change from existing arrangement. Low height kerb along length of bay. Bus stop located on London Wall is 145m from the Moor Street junction with Fore Street.
Bus Stop Type	Flag only	3	3	2	3	1	3	3	3	1	3	2	2	Note that the bus stop on the southern side of London Wall has shelter and perch seat.
Toilets														
Accessible Toilets Changing Places Toilets	100 m to 500 m away Within 500 m	3	3	3	3 3	2	3 3	3 3	4	3	3	3	4	No additional provision proposed. Accessible toilets are available at El Vino Alban Gate which is located 0.3 miles (480m) away. No additional provision proposed. Changing Places toilets are available at the Barbican Centre Beech Street, 480m (0.3 mile) from the Moor Lane junction with Fore Street https://www.changing-places.org/find
Published September 2022	The City of London Street Accessibility Tool (CoLSAT) was developed by Ross Atkin Associates and Urban Movement for the City of London Corporation.	17	Ross Atki Asso	n ciates								U m	rban ovement	

Moor Lane section 2 - existing layout

Page		Moor	Lane	sectio	n 2 - e	existin	g layo	ut								
C O L A City of London Street Accessibility Tool	Step 1 Set each of the drop downs below to best describe the street characteristics for the section being analysed	Step 2 Step 3 Review the results for each needs segment b Hover the cursor over the box next to each score to read quotes explaining how participants in the segment are affected by the feature														
v 1.2		EWC	MWC	<u>ь</u> мs			LC	GD	RS	<u></u> Я	ANI	CCO AT	DI	Comments		
Crossing Point																
Crossing Type Crosses Over	Uncontrolled crossing < 6 m road width Carriageway (motor vehicles and cycles together)	3	3	4	3	3	3	3	3	3	3	3 3	2	~2.9m - uncontrolled crossing along Moor Lane, north of Police box. Carriageway level with footway. No protected space for cyclists. Mixed traffic. This could be problematic as carriageway width decreases dramatically. Note that there is shared use along this section which could cause conflict between pedestrians and cyclists, particularly for more vulnerable users.		
					0			4	4	0				This is problematic given that the carriageway and		
Edge Marking Tactie Paving Back Edge Tactie Paving Colour Tactile Paving Tonal Contrast Tactile Paving Stem Length Tactile Paving Stem Width Island Type	No tactile edge marking Back edge offset from kerb edge Tactile colour not as per guidance Tacile without significant contrast with surounding paving Tactile stem within 0.5 m of building line Tactile stem 800 mm width No island	3 3 3 3 3 3 2	3 3 3 3 3 3	2 3 3 3 3 3 3 3 2	3 3 3 3 3 3 2	4 3 3 1 2 2	2 3 3 4 3	2 3 2 3 3 3	3 3 2 3 3 3	3 2 2 3 4 2	4 3 3 3 3 4 2	2 3 3 4 3 2	0 3 3 3 3 3 3 3	footway are flush along this section.		
Island Depth	Island depth > 1.2 m	3	4	3	3	3	3	4	3	4	4	4	3			
Kerb Drop Slope Kerb Drop Tactile Signal (red/green man) Audible (beeping) Count Down Tactile Rotating Cone	Kerb drop < 1/12, 4.7deg, 8% incline Kerb drop with tactile paving Far side signal No Audible No count down Rotating cone right side only	3 3 3 2 3	3 2 4 3 3 3	3 2 3 3	3 4 2 3 3	3 1 3 3 3 3	3 3 4 2 3 2	3 3 4 3 3 3	3 4 2 3 3	3 3 4 3 2 3	2 3 4 2 3 3	3 4 3 3 3	4 3 1 2 3	No slope, flush.		
Surface Material																
Surface Type Pattern	Smooth York Stone Uniform paving colour	3	3 3	3 3	3 3	4	4	4 3	3 3	3 3	4	3 4	3 3	Good quality footway. All grey.		
Contrast with Road	Lower tonal contrast between paving and road	3	3	3	3	3	3	2	3	2	3	3	3	Grey york stone isn't high contrasting against the grey, asphalt carriageway.		
Lines	yellow/red/white lines at road edge	3	3	4	3	3	3	3	4	3	4	4	4	Double yellow lines along this section, although slightly faded.		
Kerb Kerb Type (crossing over)	Creasing unstand 0 mm to 2 mm (undelineated)	2	4	2	2	4	0	0	1	2	1	2	1	Flush with no tactiles.		
	Crossing upstand 0 mm to 3 mm (undelineated) Deliniating upstand 0 mm to 3 mm (undelineated)	3	4	3 3	3	2	0	1	3	3	2	2	1	Flush.		
Footway Width																
Width	Footway width > 5 m	4	4	4	4	3	2	3	3	4	4	4	4	~7.2m wide on western and eastern side. Footway narrows slightly on eastern side to ~4m (adjacent to the bollards). Obstructions include bollards, fire gate, CoL Police box, and lamp columns. Bollards/lamp columns are placed ~1.5m away from one another. Space feels cluttered, 4 bollards and security gate post on western footway, plus 2 bollards and security gate post on		
Unobstructed Width	Min unobstructed width > 1.5 m	3	3	3	3	3	4	3	3	4	3	3	3	eastern side.		
Street Furniture																
Position Cafe Tables Temporary Items	Street furniture < 0.5 m from kerb No cafe tables No temporary obstructions	3 4 4	3 4 4	3 4 4	4 3 4	4 3 4	3 4 4	2 3 4	3 3 4	4 3 4	4 4 4	3 3 4	3 4 4	Lamp columns located adjacent to building line and/or kerb. Security bollards places ~1.5m apart.		

Page														
N Street Furniture Height	Street furniture > 0.9 m height	3	3	3	3	4	3	3	3	3	3	3	3	Lamp columns, gate, police box and bollards all >0.9m. Black bollards/lamp columns contrast with york stone
Contrast	High tonal contrast with paving	3	3	4	3	3	3	4	4	3	3	3	3	paving. Some of the bollards have been retrofitted with bright colours, improving their visibility further. Benches located within the Barbican Estate, approximately 0.3 miles (480m) away. Additional seating is available at the Finsbury Circus Western
Bench Spacing Bench Design Bench Seat Height	Bench > 400 m away Benches with arms + Backrests Benches seat height 45 to 50 cm	3 3 3	3 3 3	3 4 3	1 4 4	0 4 3	3 3 3	3 3 3	2 4 3	2 4 4	1 4 3	2 3 3	3 3 3	Arm, also 480m away.
														Although located in the middle of the City, the seating within the Barbican Centre offers a relaxing, pleasant sensory experience (traffic free, planting, water). Finsbury Circus is located adjacent to Moorgate, which is a busy through routes and bus routes. Some greening is present within Finsbury Circus Gardens however. (Andrea, I've gone for neutral here given that the Barbican centre offers a really nice sensory experience however outside of this, seating in the area is generally located adjacent to busy roads/where
Bench Sensory Experience	No sensory experience	3	3	3	3	3	3	3	3	3	3	3	3	there is high footfall)
Slopes Gradient (in direction of travel		3	4	4	4	3	3	3	4	3	4	3	3	Assumption based on google.
Camber (across footway)	Camber < 1/50	3	4	3	4	3	3	3	3	3	4	3	4	Assumption based on google.
Vehicle Access Vehicle Crossover	No crossover	3	3	3	3	3	3	3	3	3	3	3	3	
Blue Badge Parking	Blue badge parking Within 100 m	4	3	3	3	3	3	3	3	3	3	3	3	Two disabled parking bays are present outside Salters Hall on Fore Street, roughly 70m from the Police box. Taxi rank is located ~320m from the Police box (taxi rank located outside 28 Ropemaker Street). Taxis are
Taxi Drop Off Location Taxi Drop Off Kerb Dedicated Taxi Drop Off	Taxi drop off within 10 m Taxi drop off kerb > 150 mm Dedicated taxi drop off point / taxi rank	4 4 3	4 4 3	3 3 4	4 3 4	4 2 4	4 3 3	4 3 3	4 3 4	4 3 3	4 4 4	4 3 4	4 4 4	also permitted to drop off on double yellow lines on Moor Lane. Low height kerb along length of bay. Bus stop located on London Wall is located 160m
Bus Stop Location Bus Stop Kerb Height	100 m to 250 m away 125 mm to 140 mm	3 3	3	2 3	3	2	3 3	3 3	3 3	2 3	3	3 3	3 3	away from the Police box. Note that the bus stop on the southern side of London
Bus Stop Type	Flag only	3	3	2	3	1	3	3	3	1	3	2	2	Wall has shelter and perch seat.
Toilets														
Accessible Toilets	100 m to 500 m away	3	3	3	3	2	3	3	4	3	3	3	4	Accessible toilets are available at El Vino Alban Gate which is located 0.3 miles (480m) away. Changing Places toilets are available at the Barbican Centre Beech Street, 480m (0.3 mile) from the Moor Lane junction with Fore Street https://www.changing-
Changing Places Toilets	Within 500 m	3	4	3	3	3	3	3	3	3	3	4	4	places.org/find
Published September 2022	The City of London Street Accessibility Tool (CoLSAT) was developed by Ross Atkin Associates and Urban Movement for the City of London Corporation.	r	Ross Atki Asso									U m	ovement	

Moor Lane section 2 - proposed layout

		Moor	Lane	sectio	n 2 - p	propos	sed lay	rout						
COLSA CIty of London Street Accessibility Tool	Step 1 Set each of the drop downs below to best describe the street characteristics for the section being analysed	Step 2 Review t		or each nee	eds segmen		e cursor ove nent are affe			core to read	l quotes exp	laining how	participants	in
v 1.2		EWC	MWC	L) MS	۲ WA) WI	LC	GD	RS	× HI	ANI	CXO AT	DI	Comments
Crossing Point														
Crossing Type	Uncontrolled crossing < 6 m road width	3	3	4	3	3	3	3	3	3	3	3	2	No change from existing arrangement. ~2.9m - uncontrolled crossing along Moor Lane, north of Police box. Carriageway level with footway. No change from existing arrangement. No protected space for cyclists. Mixed traffic. This could be problematic as carriageway width decreases dramatically. Note that there is shared use along this section which could cause conflict between pedestrians and cyclists, particularly for more vulnerable users. Recommendation: consider implications of shared use space for some vulnerable
Crosses Over	Carriageway (motor vehicles and cycles together)	3	3	3	3	3	3	3	3	3	3	3	4	users. No change from existing arrangement. This is problematic given that the carriageway and footway
Edge Marking Tactie Paving Back Edge Tactie Paving Colour Tactile Paving Tonal Contrast Tactile Paving Stem Length Tactile Paving Stem Width Island Type Island Depth	No tactile edge marking Back edge offset from kerb edge Tactile colour not as per guidance Tactile vithout significant contrast with surounding paving Tactile stem within 0.5 m of building line Tactile stem 800 mm width No island Island depth > 1.2 m	3 3 3 3 3 2 2 3	3 3 3 3 3 3 4	2 3 3 3 3 3 2 3	3 3 3 3 3 2 3 3	4 3 3 3 1 2 2 3	0 2 3 3 4 3 2 3	1 2 3 2 3 3 2 4	1 3 2 3 3 3 3 3 3	3 3 2 2 3 4 2 4	4 3 3 3 3 4 2 4	2 3 3 4 3 2 4	0 3 3 3 3 3 3 3 3 3	are flush along this section.
Kerb Drop Slope Kerb Drop Tactile Signal (red/green man) Audible (beeping) Count Down Tactile Rotating Cone	Kerb drop < 1/12, 4.7deg, 8% incline Kerb drop with tactile paving Far side signal No Audible No count down Rotating cone right side only	3 3 3 2 3	3 2 4 3 3 3	3 2 2 3 3	3 4 2 3 3	3 1 3 3 3 3	3 4 2 3 2	3 3 4 3 3 3	3 3 4 2 3 3	3 3 4 3 2 3	2 3 4 2 3 3 3	3 4 3 3 3	4 3 1 2 3	Flush? So assume this falls within this category. CoL to confirm.
Surface Material														
Surface Type Pattern	Smooth York Stone Uniform paving colour	3	3 3	3 3	3 3	4	4	4	3 3	3 3	4	3	3 3	Footway's will be repaved. All grey. No change from existing arrangement. Grey york stone isn't high contrasting against the grey, asphalt
Contrast with Road	Lower tonal contrast between paving and road	3	3	3	3	3	3	2	3	2	3	3	3	carriageway. Double yellow lines will be repainted along this
Lines	yellow/red/white lines at road edge	3	3	4	3	3	3	3	4	3	4	4	4	section.
Kerb				-	-			-		-		0		No shange from evicting
Kerb Type (crossing over) Kerb Type (moving alongside) Footway Width	Crossing upstand 0 mm to 3 mm (undelineated)) Deliniating upstand 0 mm to 3 mm (undelineated)	3 3	4	3 3	2	2	0	1	3	3	2	2	1	No change from existing arrangement. Flush. No change from existing arrangement. Flush.

Page														
214														Footway widths on western will reduce due to implementation of the planters/rain gardens:
														Large rain garden (north): 1.9m to the west, 1.7m to the east Smaller rain garden (south):
														 1.8m to the west, 1.9m to the east ((Footway on eastern side remains unchanged with proposals = ~7.2m wide eastern side at it's widest,
Width	Footway width 1.5 m to 2 m	3	3	3	2	2	4	3	3	2	2	2	3	and -4m at it's narrowest (adjacent to the bollards)) Majority of the street furniture along this section will remain unchanged with the proposals. Obstructions include bollards, fire gate, and lamp columns. Bollards/lamp columns are placed ~1.5m away from one another. Space feels cluttered, 4 bollards and security gate post on western footway, plus 2 bollards and security gate post on eastern side. Recommendation: Consider the type of tree species,
														selecting those with minimal leaf shedding to avoid a slippery footway. Two rain gardens are also being proposed in this section. Recommendation: Ensure sufficient width is maintained on both sides to ensure
Unobstructed Width	Min unobstructed width > 1.5 m	3	3	3	3	3	4	3	3	4	3	3	3	accessibility (2m preferred, 1.5m minimum)
Street Furniture														Lamp columns located adjacent to building line and/or
Position Cafe Tables Temporary Items	Street furniture < 0.5 m from kerb No cafe tables No temporary obstructions	3 4 4	3 4 4	3 4 4	4 3 4	4 3 4	3 4 4	2 3 4	3 3 4	4 3 4	4 4 4	3 3 4	3 4 4	kerb. Security bollards places ~1.5m apart. New tress will be located close to the kerb.
Street Furniture Height	Street furniture > 0.9 m height	3	3	3	3	4	3	3	3	3	3	3	3	Lamp columns, gate, tree and bollards all >0.9m. CoL to confirm height of rain gardens - assume these are >0.9m Majority of these features will remain unchanged.
														Bollards are being retained. Black bollards/lamp columns contrast with york stone paving. Some of the bollards have been retrofitted with bright colours,
Contrast	High tonal contrast with paving	3	3	4	3	3	3	4	4	3	3	3	3	improving their visibility further. Recommendation: ensure rain gardens/planters contrast with paving. No proposals for additional seating. Recommendation: the addition of seating at the edge of the rain gardens could also be considered to capitalise on the public realm improvements and shading associated with the greening. Benches located within the Barbican Estate, approximately 0.3 miles (480m) away. Additional
Bench Spacing Bench Design	Bench > 400 m away Benches with arms + Backrests	3 3	3 3	3	1	0	3 3	3 3	2	2	1	2	3 3	seating is available at the Finsbury Circus Western Arm, also 480m away.
Bench Seat Height	Benches seat height 45 to 50 cm	3	3	3	4	3	3	3	3	4	3	3	3	Although located in the middle of the City, the seating within the Barbican Centre offers a relaxing, pleasant sensory experience (traffic free, planting, water). Finsbury Circus is located adjacent to Moorgate, which is a busy through routes and bus routes. Some greening is present within Finsbury Circus Gardens however. (Andrea, I've got for neutral here given that the Barbican centre offers a really nice sensory experience however outside of this, seating in the area is generally located adjacent to busy roads/where
Bench Sensory Experience	No sensory experience	3	3	3	3	3	3	3	3	3	3	3	3	
Slopes														
Gradient (in direction of travel	I) Gradient < 1/50	3	4	4	4	3	3	3	4	3	4	3	3	Assumption based on google.



Moor Lane section 3 - existing layout

C O L S A City of London Street Accessibility Tool V 1.2	Step 1 Set each of the drop downs below to best describe the street characteristics for the section being analysed	Step 2 Review t		or each nee	eds segment		e cursor ove nent are affect LC		ext to each s feature	score to read	d quotes exp	laining how	participants	in Comments
Crossing Point		2110	MITO	mo			20	00	i to		7.11	7.1	DI	
Crossing Type Crosses Over Edge Marking Tactie Paving Back Edge Tactie Paving Colour Tactile Paving Tonal Contrast	Uncontrolled crossing > 8m road width Carriageway (motor vehicles and cycles together) No tactile edge marking Back edge offset from kerb edge Tactile colour not as per guidance Taclie without significant contrast with surounding paving	3 3 3 3 3 3 3	2 3 3 3 3 3 3	3 3 2 3 3 3	1 3 3 3 3 3 3	2 3 4 3 3 3	0 3 0 2 3 3	2 3 1 2 3 2	2 3 1 3 3 2	3 3 3 3 2 2	1 3 4 3 3 3	2 3 2 3 3 3	1 4 0 3 3 3	~8.7m - uncontrolled crossing at the resident car park access road junction with Moor Lane. No protected space for cyclists. Mixed traffic. No tactile edge marking on either side of the footway.
Tactile Paving Stem Length Tactile Paving Stem Width Island Type Island Depth	Tactile stem within 0.5 m of building line Tactile stem 800 mm width No island Island depth > 1.2 m	3 3 2 3	3 3 3 4	3 3 2 3	3 3 2 3	1 2 2 3	4 3 2 3	3 3 2 4	3 3 3 3	3 4 2 4	3 4 2 4	4 3 2 4	3 3 3 3	No island although, because this is an access road, the vehicle numbers are likely to be low.
Kerb Drop Slope Kerb Drop Tactile Signal (red/green man) Audible (beeping) Count Down	Kerb drop < 1/12, 4.7deg, 8% incline Kerb drop with tactile paving Far side signal No Audible No count down	3 3 3 2	3 2 4 3 3	3 2 2 3	3 4 2 3	3 1 3 3	3 3 4 2 3	3 3 4 3 3	3 3 4 2 3	3 3 4 3 2	2 3 4 2 3	3 4 3 3	4 3 1 2	Note: CoL Standard Details 11 (SD 11) suggest max fall of 1:12, ideal fall of 1:20. Confirm with CoL.
Tactile Rotating Cone Surface Material	Rotating cone right side only	3	3	3	3	3	2	3	3	3	3	3	3	
Surface Type Pattern	Smooth York Stone Uniform paving colour	3 3	3 3	3 3	3 3	4	4	4	3 3	3 3	4	3	3 3	Good quality footway. All grey. Grey york stone isn't high contrasting against the grey,
Contrast with Road	Lower tonal contrast between paving and road	3	3	3	3	3	3	2	3	2	3	3	3	asphalt carriageway. Double yellow lines along this section, although slightly faded in some places.
Lines Kerb	yellow/red/white lines at road edge	3	3	4	3	3	3	3	4	3	4	4	4	laded in some places.
Kerb Type (crossing over) Kerb Type (moving alongside)	Crossing upstand 0 mm to 3 mm (undelineated) Deliniating kerb 100 mm to 150 mm	3	4	3 3	3 3	4	0	0	1 3	2	4	2 4	1	Flush no tactiles.
Footway Width														
Width Unobstructed Width	Footway width > 5 m Min unobstructed width > 1.5 m	4	4	4	4	3 3	2	3 3	3 3	4 4	4	4	4	~6.7m south of the access road.
Street Furniture														
Position Cafe Tables Temporary Items Street Furniture Height	Street furniture < 0.5 m from kerb No cafe tables No temporary obstructions Street furniture > 0.9 m height	3 4 4 3	3 4 4 3	3 4 4 3	4 3 4 3	4 3 4 4	3 4 4 3	2 3 4 3	3 3 4 3	4 3 4 3	4 4 4 3	3 3 4 3	3 4 4 3	Bollards more than >0.9m.
Contrast	High tonal contrast with paving	3	3	4	3	3	3	4	4	3	3	3	3	Black bollards/lamp columns contrast with york stone paving. Benches located within the Barbican Estate, approximately 0.3 miles (480m) away. Additional seating is available at the Finsbury Circus Western
Bench Spacing Bench Design Bench Seat Height	Bench > 400 m away Benches with arms + Backrests Benches seat height 45 to 50 cm	3 3 3	3 3 3	3 4 3	1 4 4	0 4 3	3 3 3	3 3 3	2 4 3	2 4 4	1 4 3	2 3 3	3 3 3	Arm, also 480m away.

Bench Sensory Experience	No sensory experience	3	3	3	3	3	3	3	3	3	3	3	3	Although located in the middle of the City, the seating within the Barbican Centre offers a relaxing, pleasant sensory experience (traffic free, planting, water). Finsbury Circus is located adjacent to Moorgate, which is a busy through routes and bus routes. Some greening is present within Finsbury Circus Gardens however. (Andrea, I've got for neutral here given that the Barbican centre offers a really nice sensory experience however outside of this, seating in the area is generally located adjacent to busy roads/where there is high footfall)
Slopes														, , , , , , , , , , , , , , , , , , ,
Gradient (in direction of travel Camber (across footway)) Gradient < 1/50 Camber < 1/50	3 3	4	4	4	3 3	3 3	3 3	4	3 3	4 4	3 3	3	Assumption based on google. Assumption based on google.
Vehicle Access														
Vehicle Crossover Blue Badge Parking	Crossover level Blue badge parking Within 100 m	3	2	3	2	4	2	1	2	4	3	3	2	Two disabled parking bays are present outside Salters' Hall on Fore Street, roughly 90m from the access road.
Dive Dauge Faiking		4	3	5	3	3	3	3	3	3	3	3	3	Taxi rank is located ~320m from the access road (taxi rank located outside 28 Ropemaker Street). Taxis also permitted to drop off on double yellow lines on Moor
Taxi Drop Off Location Taxi Drop Off Kerb	Taxi drop off within 10 m Taxi drop off Kerb > 150 mm	4	4	3 3	4	4	4	4	4	4	4	4	4	Lane. Low height kerb along length of bay.
Dedicated Taxi Drop Off	Dedicated taxi drop off point / taxi rank	3	3	4	4	4	3	3	4	3	4	4	4	
Bus Stop Location Bus Stop Kerb Height	100 m to 250 m away 125 mm to 140 mm	3 3	3	2	3	2	3 3	3 3	3 3	2 3	3	3 3	3 3	Bus stop located on London Wall is located 170m away from the access road.
Bus Stop Type	Flag only	3	3	2	3	1	3	3	3	1	3	2	2	Note that the bus stop on the southern side of London Wall has shelter and perch seat.
Toilets														
Accessible Toilets	100 m to 500 m away	3	3	3	3	2	3	3	4	3	3	3	4	Accessible toilets are available at El Vino Alban Gate which is located 0.3 miles (480m) away. Changing Places toilets are available at the Barbican Centre Beech Street, 0.3 miles (480m) away from the
Changing Places Toilets	Within 500 m	3	4	3	3	3	3	3	3	3	3	4	4	Moor Lane junction with Fore Street https://www.changing-places.org/find
	The City of London Street Accessibility Tool (CoLSAT) was developed		Ross					X					urhan_	
Published September 2022	by Ross Atkin Associates and Urban Movement for the City of London Corporation.	ſ	Atki									m	ovement	

Moor Lane section 3 - proposed layout

Page	Моо	or Lane	e sect	ion 3 -	· propo	osed la	ayout							
2 2 2 2 2 2 2 2 2 2 2 2 2 2	Step 1 Set each of the drop downs below to best describe the street characteristics for the section being analysed	Step 2 Review t		or each nee	ds segmen			r the box ne cted by the f		core to read	quotes exp	laining how	participants	in
v 1.2		EWC	Òl. MWC	MS		۲ wi	LC	GD	RS	<u></u> Я	ANI	CCO AT	DI	Comments
Crossing Point														
Crossing Type	Uncontrolled crossing > 8m road width	3	2	3	1	2	0	2	2	3	1	2	1	No change from existing arrangement. ~8.7m - uncontrolled crossing at the resident car park access road junction with Moor Lane. No change from existing arrangement. No protected
Crosses Over	Carriageway (motor vehicles and cycles together)	3	3	3	3	3	3	3	3	3	3	3	4	space for cyclists. Mixed traffic. See Standard Details 10 (SD 10). Tactile paving proposed at this junction. This will enable crossing/kerb detection. Recommendation:
Edge Marking Tactie Paving Back Edge Tactie Paving Colour	800 mm deep tactile paving edge marking (full width of flush area) Back edge offset from kerb edge Tactile colour as per guidance (red at contr. buff at uncontr.)	3 3 3	3 3 3	4 3 3	3 3 3	1 3 3	3 2 3	3 2 3	4 3 3	3 3 3	3 3 3	4 3 3	3 3 3	Arrangement will need to be consdidered to ensure correct and safe direction of travel.
Tactile Paving Tonal Contrast Tactile Paving Stem Length Tactile Paving Stem Width	Tacile without significant contrast with surounding paving Tactile stem within 0.5 m of building line Tactile stem 800 mm width	3 3	3 3 3	3 3 3	3 3	3 1 2	3 4 3	2 3 3	2 3 3	2 3 4	3 3 4	3 4 3	3 3	Proposed tactile paving colour does not contrast enough with york stone paving.
Island Type Island Depth	No island Island depth > 1.2 m	2	3	2	2	2	2	2	3	2	2	2	3	No change from existing arrangement. No island although, because this is an access road, the vehicle numbers are likely to be low.
Kerb Drop Slope Kerb Drop Tactile Signal (red/green man)	Kerb drop < 1/12, 4.7deg, 8% incline Kerb drop with tactile paving Far side signal	3	3 2 4	3	3 4 4	3 1 3	3 3 4	3 3 4	3 3 4	3 3 4	2 3 4	3 4 4	4 3	Standard Details 11 (SD 11) suggest max fall of 1:12, ideal fall of 1:20. Confirm with CoL.
Audible (beeping) Count Down Tactile Rotating Cone	No Audible No count down Rotating cone right side only	3 2 3	3 3 3	2 3 3	2 3 3	3 3 3	2 3 2	3 3 3	2 3 3	3 2 3	2 3 3	3 3 3	1 2 3	
Surface Material														
Surface Type Pattern	Smooth York Stone Uniform paving colour	3 3	3 3	3 3	3 3	4	4	43	3 3	3 3	4	3	3 3	Footway's will be repaved. All grey. No change from existing arrangement. Grey york stone isn't high contrasting against the grey, asphalt
Contrast with Road Lines	Lower tonal contrast between paving and road yellow/red/white lines at road edge	3 3	3 3	3	3 3	3 3	3 3	2	3	2	3	3	3	carriageway. Double yellow lines will be repainted along this section.
Kerb														
														Standard Details 11 (SD 11) suggest granite kerbs will be used which will be flush with carriageway. Confirm
Kerb Type (crossing over) Kerb Type (moving alongside)	Crossing upstand 0 mm to 3 mm + 800 tactile paving Deliniating kerb 100 mm to 150 mm	4	3	4	4	2	3 3	4	3 3	3 3	4	3	3 3	with CoL.
Footway Width														
Width Unobstructed Width	Footway width > 5 m Min unobstructed width > 1.5 m	4	4	4	4	3 3	2	3 3	3 3	4	4	4	4	No change from existing arrangement. ~6.7m south of the access road.
Street Furniture														
Position Cafe Tables Temporary Items	Street furniture < 0.5 m from kerb No cafe tables No temporary obstructions	3 4 4	3 4 4	3 4 4	4 3 4	4 3 4	3 4 4	2 3 4	3 3 4	4 3 4	4 4 4	3 3 4	3 4 4	

P														
Page														
Ф N														
Street Furniture Height	Street furniture > 0.9 m height	3	3	3	3	4	3	3	3	3	3	3	3	No change from existing arrangement. Bollards more than >0.9m. No change from existing arrangement. Black
Contrast	High tonal contrast with paving	3	3	4	3	3	3	4	4	3	3	3	3	bollards/lamp columns contrast with york stone paving.
														No proposals for additional seating. Recommendation: the addition of seating at the edge of the planters/and or rain gardens could also be considered to capitalise on the public realm improvements and shading assocciated with the greening. Benches located within the Barbican Estate, approximately 0.3 miles (480m) away. Additional seating is available at the Finsbury
Bench Spacing	Bench > 400 m away	3	3	3	1	0	3	3	2	2	1	2	3	Circus Western Arm, also 480m away.
Bench Design Bench Seat Height	Benches with arms + Backrests Benches seat height 45 to 50 cm	3 3	3 3	4	4	3	3 3	3 3	3	4	4	3 3	3 3	
	J													Although located in the middle of the City, the seating within the Barbican Centre offers a relaxing, pleasant sensory experience (traffic free, planting, water). Finsbury Circus is located adjacent to Moorgate, which is a busy through routes and bus routes. Some greening is present within Finsbury Circus Gardens
Bench Sensory Experience	No sensory experience	3	3	3	3	3	3	3	3	3	3	3	3	however.
Slopes														
Gradient (in direction of travel)		3	4	4	4	3	3	3	4	3	4	3	3	Assumption based on google.
Camber (across footway)	Camber < 1/50	3	4	3	4	3	3	3	3	3	4	3	4	Assumption based on google.
Vehicle Access														
Vehicle Crossover	Crossover level	3	2	3	2	4	2	1	2	4	3	3	2	No change from existing arrangement Two disabled parking bays are proposed ~10m north of the access road.
Blue Badge Parking	Blue badge parking Within 100 m	4	3	3	3	3	3	3	3	3	3	3	3	Two disabled parking bays are present outside Salters' Hall on Fore Street, roughly 70m from the Police box. Taxi rank is located ~320m from the Police box (taxi rank located outside 28 Ropemaker Street). Taxis are also permitted to drop off on double yellow lines on
Taxi Drop Off Location Taxi Drop Off Kerb	Taxi drop off within 10 m Taxi drop off Kerb > 150 mm	4	4	3 3	4	4	4	4	4	4	4	4	4	Moor Lane. Low height kerb along length of bay.
Dedicated Taxi Drop Off Bus Stop Location	Dedicated taxi drop off point / taxi rank 100 m to 250 m away	3	3 3	4	3	4	3 3	3 3	3	3	3	3	3	Bus stop located on London Wall is located 160m away from the Police box.
Bus Stop Kerb Height	125 mm to 140 mm	3	4	3	4	4	3	3	3	3	4	3	3	Note that the bus stop on the southern side of London
Bus Stop Type	Flag only	3	3	2	3	1	3	3	3	1	3	2	2	Wall has shelter and perch seat.
Toilets														
Accessible Toilets	100 m to 500 m away	3	3	3	3	2	3	3	4	3	3	3	4	Accessible toilets are available at El Vino Alban Gate which is located 0.3 miles (480m) away. Changing Places toilets are available at the Barbican Centre Beech Street, 0.3 miles (480m) away from the Moor Lane junction with Fore Street
Changing Places Toilets	Within 500 m	3	4	3	3	3	3	3	3	3	3	4	4	https://www.changing-places.org/find

Moor Lane section 4 - existing layout

COLSA	Step 1 Set each of the drop downs below to best describe the street characteristics for the section being analysed	Step 2 Review t		for each ne	eds segmer		e cursor ove gment are a			score to read	l quotes exp	laining how	participants	
v 1.2		EWC	MWC	MS			LC	GD	RS	× HI	ANI	CXX AT	DI	Comments
Crossing Point		- 1											_	
Crossing Type	Uncontrolled crossing < 6 m road width	3	3	4	3	3	з	3	3	3	3	3	2	~5m - uncontrolled crossing at the access road on the eastern side. ~4.5m at uncontrolled crossing along Union Street. Estimated ~3.5m at the 21 Moorfields access roads.
Crosses Over	Carriageway (motor vehicles and cycles together)	3	3	3	3	3	3	3	3	3	3	3	4	
Edge Marking Tactie Paving Back Edge	No tactile edge marking Back edge offset from kerb edge	3 3	3 3	2 3	3 3	4 3	0 2	1	1 3	3 3	4 3	2 3	0 3	No tactile edge marking on either side of the footways.
Tactie Paving Colour Tactie Paving Tonal Contrast Tactie Paving Stem Length Tactie Paving Stem Width Island Type	Tactile colour not as per guidance Tacile without significant contrast with surounding paving Tactile stem within 0.5 m of building line Tactile stem 800 mm width No island	3 3 3 2	3 3 3 3 3	3 3 3 2	3 3 3 2	3 3 1 2 2	3 3 4 3 2	3 2 3 3 2	3 2 3 3 3	2 2 3 4 2	3 3 4 2	3 3 4 3 2	3 3 3 3 3	
Island Depth Kerb Drop Slope	Island depth > 1.2 m Kerb drop 1/6, 9.5 deg, 17% to 1/12, 4.7deg, 8% incline	3	4	3	3	3 2	3 3	4	3 3	4	4	4	3 3	Dropped kerbs are lacking on the access roads outside 21 Moorfields.
Kerb Drop Tactile Signal (red/green man)	Kerb drop without tactile paving Far side signal	3 3	4	3 2	2 4	3	2 4	2 4	3 4	3 4	4	3 4	1 3	
Audible (beeping) Count Down Tactile Rotating Cone	No Audible No count down Rotating cone right side only	3 2 3	3 3 3	2 3 3	2 3 3	3 3 3	2 3 2	3 3 3	2 3 3	3 2 3	2 3 3	3 3 3	1 2 3	
Surface Material														
Surface Type	Smooth York Stone	3	3	3	3	4	4	4	3	3	4	3	3	Good quality footway. Patterned setts are used on the vehicle crossover at
Pattern	Pattern in paving	3	3	3	3	3	3	2	2	3	3	3	3	the southern access road. Asphalt used at the other access roads.
Contrast with Road	Lower tonal contrast between paving and road	3	3	3	3	3	3	2	3	2	3	3	3	Grey york stone isn't high contrasting against the grey, asphalt carriageway. Double yellow lines along this section, although faded
Lines	yellow/red/white lines at road edge	3	3	4	3	3	3	3	4	3	4	4	4	in some places. Motor vehicle parking along eastern section.
Kerb														
Kerb Type (crossing over) Kerb Type (moving alongside)	Crossing kerb 100 mm to 150 mm Deliniating kerb 100 mm to 150 mm	0	0	0	2	2	2	3 3	1	2	2	3	0	Note that some of the access roads outside of 21 Moorfields do not have dropped kerbs along some sections.
Footway Width														
Width Unobstructed Width	Footway width 2 m to 5 m Min unobstructed width > 1.5 m	4	4	4	4	3 3	3	3 3	4	3	3 3	4	4	~4m south of the access road. Estimated width outside 21 Moorfields ~3-3.5m.
Street Furniture														
Position Cafe Tables Temporary Items Street Furniture Height	Street furniture < 0.5 m from kerb No cafe tables No temporary obstructions Street furniture > 0.9 m height	3 4 4 3	3 4 4 3	3 4 4 3	4 3 4 3	4 3 4 4	3 4 4 3	2 3 4 3	3 3 4 3	4 3 4 3	4 4 4 3	3 3 4 3	3 4 4 3	Bollards more than >0.9m.
Contrast	High tonal contrast with paving	3	3	4	3	3	3	4	4	3	3	3	3	Black bollards contrast with york stone paving/carriageway. Benches located within the Barbican Estate, approximately 0.3 miles (480m) away. Additional seating is available at the Finsbury Circus Western
Bench Spacing Bench Design Bench Seat Height	Bench > 400 m away Benches with arms + Backrests Benches seat height 45 to 50 cm	3 3 3	3 3 3	3 4 3	1 4 4	0 4 3	3 3 3	3 3 3	2 4 3	2 4 4	1 4 3	2 3 3	3 3 3	Arm, also 480m away.

Bench Sensory Experience	No sensory experience	3	3	3	3	3	3	3	3	3	3	3	3	Although located in the middle of the City, the seating within the Barbican Centre offers a relaxing, pleasant sensory experience (traffic free, planting, water). Finsbury Circus is located adjacent to Moorgate, which is a busy through routes and bus routes. Some greening is present within Finsbury Circus Gardens however. (Andrea, I've got for neutral here given that the Barbican centre offers a really nice sensory experience however outside of this, seating in the area is generally located adjacent to busy roads/where there is high footfall)
Slopes														
Gradient (in direction of travel Camber (across footway)	I) Gradient < 1/50 Camber < 1/50	3 3	4	4	4	3 3	3 3	3 3	4	3 3	4	3 3	3	Assumption based on google. Assumption based on google.
Vehicle Access														
Vehicle Crossover	Crossover level	3	2	3	2	4	2	1	2	4	3	3	2	Two disabled parking bays are present outside Salters' Hall on Fore Street, roughly 90m from the access road.
Blue Badge Parking	Blue badge parking Within 100 m	4	3	3	3	3	3	3	3	3	3	3	3	Taxi rank is located ~320m from the access road (taxi rank located outside 28 Ropemaker Street). Taxis also permitted to drop off on double yellow lines on Moor
Taxi Drop Off Location Taxi Drop Off Kerb Dedicated Taxi Drop Off	Taxi drop off within 10 m Taxi drop off Kerb > 150 mm Dedicated taxi drop off point / taxi rank	4 4 3	4 4 3	3 3 4	4 3 4	4 2 4	4 3 3	4 3 3	4 3 4	4 3 3	4 4 4	4 3 4	4 4 4	Lane. Low height kerb along length of bay.
Bus Stop Location Bus Stop Kerb Height	100 m to 250 m away 125 mm to 140 mm	3 3	3	2 3	3	2	3 3	3 3	3 3	2 3	3	3 3	3 3	Bus stop located on London Wall is located 170m away from the access road. Note that the bus stop on the southern side of London
Bus Stop Type	Flag only	3	3	2	3	1	3	3	3	1	3	2	2	Wall has shelter and perch seat.
Toilets														
Accessible Toilets	100 m to 500 m away	3	3	3	3	2	3	3	4	3	3	3	4	Accessible toilets are available at El Vino Alban Gate which is located 0.3 miles (480m) away. Changing Places toilets are available at the Barbican Centre Beech Street, 0.3 miles (480m) away from the
Changing Places Toilets	Within 500 m	3	4	3	3	3	3	3	3	3	3	4	4	Moor Lane junction with Fore Street https://www.changing-places.org/find
[
Published September 2022	The City of London Street Accessibility Tool (CoLSAT) was developed by Ross Atkin Associates and Urban Movement for the City of London Corporation.	r	Ross Atki Asso									u m	rban ovement	

Moor Lane section 4 - proposed layout

C O L S T O L A	Step 1 Set each of the drop downs below to best describe the street characteristics for the section being analysed	Step 2 Review		or each ne	eds segmen					score to read	d quotes exp	plaining how	participant	S
v 1.2		EWC	MWC	<u>L</u> MS					RS	8				Comments
Crossing Point		EWC	WWVC	IVIO	WA	vvi	LO	GD	NJ	m	ANI	AI	Di	Comments
Crossing Type Crosses Over	Uncontrolled crossing < 6 m road width Carriageway (motor vehicles and cycles together)	3 3	3 3	4	3 3	3 3	3 3	3 3	3 3	3 3	3 3	3 3	2	~5m - uncontrolled crossing at the access road on the eastern side, plus a new access road. New Union Street will be opened up again. CoL to confirm widths. Proposals include no tactile paving on either side of the footway. This applies for the two access roads and New Union Street. Recommendation: ensure appropriate tactiles, and positioning of tactiles are in place to assist with direction of travel. This is
Edgo Morking	No tastilo adao markina	3	3	2	3	4	0	1	1	3	4	2	0	particularly important at the new access road where
Edge Marking Tactie Paving Back Edge	No tactile edge marking Back edge offset from kerb edge	3	3	3	3	4	2	2	3	3	3	3	3	the junction has a curved edge.
Tactie Paving Colour	Tactile colour not as per guidance	3	3	3	3	3	3	3	3	2	3	3	3	
	Tacile without significant contrast with surounding paving	3	3	3	3	3	3	2	2	2	3	3	3	
Tactile Paving Stem Length Tactile Paving Stem Width	Tactile stem within 0.5 m of building line Tactile stem 800 mm width	3	3	3	3	1	4	3	3	3	3	4	3	
Island Type	No island	2	3	2	2	2	2	2	3	4	4	2	3	
Island Depth	Island depth > 1.2 m	3	4	3	3	3	3	4	3	4	4	4	3	
				-										Existing access road is flush. Recommendation to ensure that kerbs are either flush or in keeping with
Kerb Drop Slope	Kerb drop < 1/12, 4.7deg, 8% incline	3	3		3	3	3	3	3	3	2	3	4	CoLs Standard Details.
Kerb Drop Tactile	Kerb drop with tactile paving	3	2	3	4	1	3	3	3	3	3	4 4	3	
Signal (red/green man) Audible (beeping)	Far side signal No Audible	3	4	2	4	3	4	4	4	4	4	4	3	
Count Down	No count down	2	3	- 3	- 3	3	- 3	3	- 3	2	- 3	3	2	
Tactile Rotating Cone	Rotating cone right side only	3	3	3	3	3	2	3	3	3	3	3	3	
Surface Material														
Surface Type	Smooth York Stone	3	3	3	3	4	4	4	3	3	4	3	3	Footway's will be repaved (majority of the footways are located within the hoarding boundary at present)
Pattern	Pattern in paving	3	3	3	3	3	3	2	2	3	3	3	3	All grey. No change from existing arrangement. Proposed grey
Contrast with Road	Lower tonal contrast between paving and road	3	3	3	3	3	3	2	3	2	3	3	3	york stone isn't high contrasting against the grey, asphalt carriageway.
														New double yellow lines will be painted along length of 21 Moorfields (bar where disabled parking bays are
Lines	yellow/red/white lines at road edge	3	3	4	3	3	3	3	4	3	4	4	4	located).
Kerb														
Kerb Type (crossing over) Kerb Type (moving alongside)	Crossing upstand 0 mm to 3 mm (undelineated) Deliniating kerb 100 mm to 150 mm	3	4	3 3	3 3	4	0	0	1	2	4	2	1	Standard Details 11 (SD 11) suggest granite kerbs will be used which will be flush with carriageway. Confirm with CoL. No existing proposals for tactile paving therefore undelineated.
Footway Width														
i oolway wiulii														Proposals see the eastern footway along 21
Width	Footway width > 5 m	4	4	4	4	3	2	3	3	4	4	4	4	Moorfields widened to approximately 5.6m in the south and 4.5m in the north in order to accommodate the proposed bollards. New street furniture including bollards, planters and trees are being proposed along this section which has the potential to make the space feel cluttered.
Unobstructed Width	Min unobstructed width > 1.5 m	3	3	3	3	3	4	3	3	4	3	3	3	Recommendation: Ensure sufficient width is maintained between/adjacent to bollards, planters and trees to ensure accessibility (2m preferred, 1.5m minimum). Also consider the type of tree species, selecting those with minimal leaf shedding to avoid a slippery footway.

Street Furniture Position	Street furniture < 0.5 m from kerb	3	3	3	4	4	3	2	3	4	4	3	3	
Cafe Tables	No cafe tables	4	4	4	3	3	4	3	3	3	4	3	4	
Temporary Items	No temporary obstructions	4	4	4	4	4	4	4	4	4	4	4	4	Bollards and trees are all >0.9m. CoL to confirm
Street Furniture Height	Street furniture > 0.9 m height	3	3	3	3	4	3	3	3	3	3	3	3	height of planters - assume these are >0.9m TBC - Recommendation: ensure planters contrast
Contrast	High tonal contrast with paving	3	3	4	3	3	3	4	4	3	3	3	3	and new bollards with paving.
														Benches located within the Barbican Estate, approximately 0.3 miles (480m) away. Additional
Bench Spacing	Bench > 400 m away	3	3	3	1	0	3	3	2	2	1	2	3	seating is available at the Finsbury Circus Western Arm, also 480m away.
Bench Design	Benches with arms + Backrests	3	3	4	4	4	3	3	4	4	4	3	3	, uni, also room anaj.
Bench Seat Height	Benches seat height 45 to 50 cm	3	3	3	4	3	3	3	3	4	3	3	3	No proposals for additional seating. Recommendation:
														the addition of seating at the edge of the rain gardens could also be considered to capitalise on the public
														realm improvements and shading associated with the
														greening. Benches located within the Barbican Estate, approximately 0.3 miles (480m) away. Additional
Bench Sensory Experience	No sensory experience	3	3	3	3	3	3	3	3	3	3	3	3	seating is available at the Finsbury Circus Western Arm, also 480m away.
			Ū	0		Ū				0	Ū	0	Ū	,
Slopes Gradient (in direction of travel	I) Gradient < 1/50	3	4	4	4	3	3	3	4	3	4	3	3	Assumption based on google.
Camber (across footway)	Camber < 1/50	3	4	3	4	3	3	3	3	3	4	3	4	Assumption based on google.
Vehicle Access														
Vehicle Crossover	Crossover level	3	2	3	2	4	2	1	2	4	3	3	2	Two disabled parking bays are proposed ~10m north
														of the access road.
														Two disabled parking bays are present outside
Blue Badge Parking	Blue badge parking Within 100 m	4	3	3	3	3	3	3	3	3	3	3	3	Salters' Hall on Fore Street, roughly 90m from the access road.
Dido Dadgo i animg		•	Ū	Ū		Ŭ	J. J	Ū		Ū	Ŭ	Ū	J. J	Taxi rank is located ~320m from the access road (taxi rank located outside 28 Ropemaker Street). Taxis also
														permitted to drop off on double yellow lines on Moor
Taxi Drop Off Location Taxi Drop Off Kerb	Taxi drop off within 10 m Taxi drop off Kerb > 150 mm	4	4	3 3	4	4	4	4	4	4	4	4	4	Lane. Low height kerb along length of bay.
Dedicated Taxi Drop Off	Dedicated taxi drop off point / taxi rank	3	3	4	4	4	3	3	4	3	4	4	4	Bus stop located on London Wall is located 170m
Bus Stop Location	100 m to 250 m away	3	3	2	3	2	3	3	3	2	3	3	3	away from the access road.
Bus Stop Kerb Height	125 mm to 140 mm	3	4	3	4	4	3	3	3	3	4	3	3	Note that the bus stop on the southern side of London
Bus Stop Type	Flag only	3	3	2	3	1	3	3	3	1	3	2	2	Wall has shelter and perch seat.
Toilets														
Accessible Toilets	100 m to 500 m away	3	3	3	3	2	3	3	4	3	3	3	4	Accessible toilets are available at El Vino Alban Gate which is located 0.3 miles (480m) away.
		0	Ŭ	0	0	2	0	0	-	0	0	Ű		Changing Places toilets are available at the Barbican
														Centre Beech Street, 0.3 miles (480m) away from the Moor Lane junction with Fore Street
Changing Places Toilets	Within 500 m	3	4	3	3	3	3	3	3	3	3	4	4	https://www.changing-places.org/find
							_ /	-						
	The City of London Street Accessibility Tool (CoLSAT) was developed		Ross					X					rban	
Published September 2022	by Ross Atkin Associates and Urban Movement for the City of London Corporation.		Atki				CIT	N V					ovement	
	· · · ·	-		.cruces			LOND							
L														1

C C S T	Step 1 Set each of the drop downs below to best describe the street characteristics for the section being analysed	Step 2 Review t		for each ne	eds segmen		e cursor ove gment are a			score to read	d quotes exp	blaining how	participants	3
v 1.2		EWC	MWC	MS			LC	GD	RS	× HI	ANI	COO AT	DI	Comments
Crossing Point														
Crossing Type Crosses Over Edge Marking Tactie Paving Back Edge Tactie Paving Colour Tactile Paving Colour Tactile Paving Stem Length Tactile Paving Stem Width Island Type Island Depth	Uncontrolled crossing < 6 m road width Carriageway (motor vehicles and cycles together) No tactile edge marking Back edge offset from kerb edge Tactile colour not as per guidance Tactile without significant contrast with surounding paving Tactile stem within 0.5 m of building line Tactile stem 800 mm width No island Island depth > 1.2 m	3 3 3 3 3 3 3 3 3 2 3 2 3	3 3 3 3 3 3 3 3 3 3 3 4	4 3 2 3 3 3 3 3 3 2 3 3 3 3 3 3 3 3 3 3	3 3 3 3 3 3 3 3 2 3 3 2 3	3 3 3 3 3 1 2 2 3	3 0 2 3 3 4 3 2 3 3	3 3 2 3 2 3 3 2 4	3 3 3 3 2 3 3 3 3 3 3 3	3 3 3 2 2 3 4 2 4 2 4	3 3 3 3 3 3 4 2 4	3 3 3 3 3 4 3 2 4	2 4 0 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	-3.7m - uncontrolled crossing at the access road on the western side. No tactile edge marking on either side of the footway.
Kerb Drop Slope Kerb Drop Tactile Signal (red/green man) Audible (beeping) Count Down Tactile Rotating Cone	Kerb drop < 1/12, 4.7deg, 8% incline Kerb drop with tactile paving Far side signal No Audible No count down Rotating cone right side only	3 3 3 2 3	3 2 4 3 3 3	3 2 3 3	3 4 2 3 3	3 1 3 3 3 3	3 3 4 2 3 2	3 4 3 3 3	3 3 4 2 3 3	3 3 4 3 2 3	2 3 4 2 3 3 3	3 4 3 3 3	4 3 1 2 3	fall of 1:12, ideal fall of 1:20. Confirm with CoL.
Surface Material Surface Type	Asphalt	4	4	3	4	4	4	2	4	4	4	3	3	Not the best quality, bumpy in some sections.
Pattern	Uniform paving colour	3	3	3	3	3	3	3	3	3	3	4	3	Asphalt isn't high contrasting against the grey, asphalt
Contrast with Road	Lower tonal contrast between paving and road	3	3	3	3	3	3	2	3	2	3	3	3	carriageway. Double yellow lines along this section, although faded
Lines	yellow/red/white lines at road edge	3	3	4	3	3	3	3	4	3	4	4	4	in some places.
Kerb														
Kerb Type (crossing over) Kerb Type (moving alongside)	Crossing upstand 0 mm to 3 mm (undelineated) Deliniating kerb 100 mm to 150 mm	3	4	3 3	3 3	4	0	0	1	2	4	2	1	Flush no tactiles.
Footway Width														
Width Unobstructed Width	Footway width 2 m to 5 m Min unobstructed width > 1.5 m	4	4	4	4	3 3	3	3 3	4	3	3 3	4	4	~3.5m south of the access road.
Street Furniture														
Position Cafe Tables Temporary Items Street Furniture Height	Street furniture < 1 m from building line No cafe tables No temporary obstructions Street furniture > 0.9 m height	1 4 4 3	2 4 4 3	2 4 4 3	2 3 4 3	2 3 4 4	2 4 4 3	2 3 4 3	1 3 4 3	1 3 4 3	1 4 4 3	2 3 4 3	2 4 4 3	Lamp columns >0.9m. Lamp columns are less contrasting with asphalt than
Contrast Bench Spacing	Low tonal contrast with paving Bench > 400 m away	3	3	3	3	2	3	2	2	3	3	2	2	the york stone paving. Benches located within the Barbican Estate, approximately 0.3 miles (480m) away. Additional seating is available at the Finsbury Circus Western Arm, also 480m away.
Bench Design Bench Seat Height	Benches with arms + Backrests Benches seat height 45 to 50 cm	3 3	3 3	4	4	43	3 3	3 3	4	4	433	3 3	3 3	Although located in the middle of the City, the seating within the Barbican Centre offers a relaxing, pleasant sensory experience (traffic free, planting, water). Finsbury Circus is located adjacent to Moorgate, which is a busy through routes and bus routes. Some greening is present within Finsbury Circus Gardens
Bench Sensory Experience	No sensory experience	3	3	3	3	3	3	3	3	3	3	3	3	however.
Slopes														
Gradient (in direction of travel Camber (across footway)) Gradient < 1/50 Camber < 1/50	3 3	4 4	4	4	3	3	3 3	4	3	4	3	3	Assumption based on google. Assumption based on google.

Vehicle Access														
Vehicle Crossover Blue Badge Parking	Crossover level Blue badge parking 100 m to 500 m away	3	2	3	2 2	4	2	1	2	4	3	3	2	Two disabled parking bays are present outside Salters' Hall on Fore Street, roughly 150m from the access road.
Taxi Drop Off Location Taxi Drop Off Kerb Dedicated Taxi Drop Off	Taxi drop off within 10 m Taxi drop off Kerb > 150 mm Dedicated taxi drop off point / taxi rank	4 4 3	4 4 3	3	4 3 4	4	4	4	4	4	4	4	4 4	Taxi rank is located ~320m from the access road (taxi rank located outside 28 Ropemaker Street). Taxis also permitted to drop off on double yellow lines on Moor Lane. Low height kerb along length of bay.
Bus Stop Location Bus Stop Kerb Height	100 m to 250 m away 125 mm to 140 mm	3 3	3	2	4 3 4	2 4	3	3 3	3 3	2	3 4	4 3 3	4 3 3	Bus stop located on London Wall is located 210m away from the access road. Note that the bus stop on the southern side of London
Bus Stop Type	Flag only	3	3	2	3	1	3	3	3	1	3	2	2	Wall has shelter and perch seat.
Toilets														
Accessible Toilets	100 m to 500 m away	3	3	3	3	2	3	3	4	3	3	3	4	Accessible toilets are available at El Vino Alban Gate which is located 0.3 miles (480m) away. Changing Places toilets are available at the Barbican Centre Beech Street, 0.3 miles (480m) away from the
Changing Places Toilets	Within 500 m	3	4	3	3	3	3	3	3	3	3	4	4	Moor Lane junction with Fore Street https://www.changing-places.org/find
·														
Published September 2022	The City of London Street Accessibility Tool (CoLSAT) was developed by Ross Atkin Associates and Urban Movement for the City of London Corporation.	R	Ross Atkir Assoc										vement	

Moor Lane section 5 - proposed layout

Page		Мо	or Lan	e sec	tion 5	- prop	osed l	ayout						
C C S T C C A C C C C C C C C C C C C C C C C C	Step 1 Set each of the drop downs below to best describe the street characteristics for the section being analysed	Step 2 Review		or each nee	ds segment			r the box ne		core to read	quotes exp	laining how	participants i	in
v 1.2		EWC	MWC	MS		۲ wi	LC	GD	RS	<u></u> Я	ANI	CO AT	DI	Comments
Crossing Point														
Crossing Type Crosses Over	Uncontrolled crossing < 6 m road width Carriageway (motor vehicles and cycles together)	333	3	4	33	3	3	3	3	3	3	3	2	No change from existing arrangement. ~3.7m - uncontrolled crossing at the access road on the western side.
Edge Marking Tactie Paving Back Edge	800 mm deep tactile paving edge marking (full width of flush area) Back edge offset from kerb edge Tactile colour as per guidance (red at contr. buff at uncontr.)	3 3 3	3 3 3	4	3 3 3	1 3 3	3 2 3	3 2 3	4	3 3	3 3 3	4 3 3	3 3 3	Tactile paving proposed at access road. Recommendation: consider tactiles across full width of flush kerb.
Tactie Paving Colour Tactile Paving Tonal Contrast Tactile Paving Stem Length Tactile Paving Stem Width Island Type	Tacile without significant contrast with surounding paving Tactile stem within 0.5 m of building line Tactile stem 800 mm width No island	3 3 3 2	3 3 3 3	3 3 3 2	3 3 3 2	3 1 2 2	3 4 3 2	2 3 3 2	2 3 3 3	2 3 4 2	3 3 4 2	3 4 3 2	3 3 3 3 3	Tactile paving colour does not contrast enough with york stone paving.
Island Depth Kerb Drop Slope Kerb Drop Tactile Signal (red/green man) Audible (beeping)	Island depth > 1.2 m Kerb drop < 1/12, 4.7deg, 8% incline Kerb drop with tactile paving Far side signal No Audible	3 3 3 3 3 3	4 3 2 4 3	3 3 2 2	3 3 4 4 2	3 3 1 3 3	3 3 4 2	4 3 3 4 3	3 3 4 2	4 3 3 4 3	4 2 3 4 2	4 3 4 4 3	3 4 3 3 1	Note: CoL Standard Details 11 (SD 11) suggest max fall of 1:12, ideal fall of 1:20. Confirm with CoL.
Count Down Tactile Rotating Cone	No count down Rotating cone right side only	2 3	3 3	3 3	3 3	3 3	3 2	3 3	3 3	2 3	3 3	3 3	2 3	
Surface Material Surface Type	Asphalt	4	4	3	4	4	4	2	4	4	4	3	3	Footway's will be repaved.
Pattern	Uniform paving colour	3	3	3	3	3	3	3	3	3	3	4	3	All grey. Upgrade from asphalt to york stone, however grey york stone isn't high contrasting against the asphalt
Contrast with Road Lines	Lower tonal contrast between paving and road yellow/red/white lines at road edge	3 3	3 3	3	3 3	3 3	3 3	2	3	2	3	3	3	carriageway. Double yellow lines will be repainted.
Kerb														
Kerb Type (crossing over) Kerb Type (moving alongside)	Crossing upstand 0 mm to 3 mm + 800 tactile paving Deliniating kerb 100 mm to 150 mm	4	3	4	4	2	3 3	4	3 3	3 3	4	3	3 3	Standard Details 11 (SD 11) suggest granite kerbs will be used which will be flush with carriageway. Confirm with CoL.
Footway Width														Footways on along this section will be increased to
Width Unobstructed Width	Footway width 2 m to 5 m Min unobstructed width > 1.5 m	43	4	43	4	3 3	3	3 3	43	3	3 3	43	4	between 5.6m towards the north, and 4.2m towards the south. This widening will help to accommodate the proposed planters, whilst leaving >2m of unobstructed footway. see above.
Street Furniture														
Position Cafe Tables Temporary Items	Street furniture < 1 m from building line No cafe tables No temporary obstructions	1 4 4	2 4 4	2 4 4	2 3 4	2 3 4	2 4 4	2 3 4	1 3 4	1 3 4	1 4 4	2 3 4	2 4 4	Lamp columns >0.9m. Assumption that planters will be
Street Furniture Height	Street furniture > 0.9 m height	3	3	3	3	4	3	3	3	3	3	3	3	>0.9cm. CoL to confirm.

Page 226														
N N N N N N N N N N N N N N N N N N N	Low tonal contrast with paving	3	3	3	3	2	3	2	2	3	3	2	2	Lamp columns are less contrasting with asphalt than the york stone paving. Recommendation: ensure that planters are contrasting enough with footway.
Bench Spacing Bench Design	Bench > 400 m away Benches with arms + Backrests	33		3	1	0	3 3	3 3	2	2	1	23	3 3	No proposals for additional seating. Recommendation: the addition of seating at the edge of the planters/and or rain gardens could also be considered to capitalise on the public realm improvements and shading assocciated with the greening. Benches located within the Barbican Estate, approximately 0.3 miles (480m) away. Additional seating is available at the Finsbury Circus Western Arm, also 480m away.
Bench Seat Height	Benches seat height 45 to 50 cm	3		3	4	3	3	3	3	4	3	3	3	Although located in the middle of the City, the seating within the Barbican Centre offers a relaxing, pleasant sensory experience (traffic free, planting, water). Finsbury Circus is located adjacent to Moorgate, which is a busy through routes and bus routes. Some greening is present within Finsbury Circus Gardens however.
Bench Sensory Experience Slopes	No sensory experience	3	3	3	3	3	3	3	3	3	3	3	3	nowever.
Gradient (in direction of travel Camber (across footway)) Gradient < 1/50 Camber < 1/50	3		4	4	3	3	3	4	3	4	3	3	Assumption based on google. Assumption based on google.
Vehicle Access		5	+	5	-	5	0	5	5	0	4	0	-	
Vehicle Crossover	Crossover level	3	2	3	2	4	2	1	2	4	3	3	2	Two disabled parking bays are proposed 50m south from the access road.
Blue Badge Parking	Blue badge parking Within 100 m	4	3	3	3	3	3	3	3	3	3	3	3	Two disabled parking bays are present outside Salters' Hall on Fore Street, roughly 150m from the access road. Taxi rank is located ~320m from the access road (taxi rank located outside 28 Ropemaker Street). Taxis also permitted to drop off on double yellow lines on Moor
Taxi Drop Off Location Taxi Drop Off Kerb	Taxi drop off within 10 m Taxi drop off Kerb > 150 mm Dedicated taxi drop off agist (taxi sank	4 4 3	4 4 3	33	4	4	4 3 3	4	4	4	4	4	4 4	Lane. Low height kerb along length of bay.
Dedicated Taxi Drop Off Bus Stop Location	Dedicated taxi drop off point / taxi rank	3	3	2	3	2	3	3 3	3	2	3	3	3	Bus stop located on London Wall is located 210m away from the access road.
Bus Stop Kerb Height Bus Stop Type	125 mm to 140 mm Flag only	3		3	4	4	3	3	3	3	4	3	3	Note that the bus stop on the southern side of London Wall has shelter and perch seat.
Toilets		5	5	2	5		5	0	5		5	2	2	
Accessible Toilets	100 m to 500 m away	3	3	3	3	2	3	3	4	3	3	3	4	Accessible toilets are available at El Vino Alban Gate which is located 0.3 miles (480m) away. Changing Places toilets are available at the Barbican Centre Beech Street, 0.3 miles (480m) away from the
Changing Places Toilets	Within 500 m	3	4	3	3	3	3	3	3	3	3	4	4	Moor Lane junction with Fore Street https://www.changing-places.org/find
Published September 2022	The City of London Street Accessibility Tool (CoLSAT) was developed by Ross Atkin Associates and Urban Movement for the City of London Corporation.	r	Ros Atk Ass									U m	i rban ovement	

Moor Lane section 6 - existing layout

C S T	Step 1 Set each of the drop downs below to best describe the street	Step 2 Review 1		or each nee	eds segment	Step 3	e cursor ove	r the box ne	ext to each s	core to read	l quotes exp	laining how	participants	
City of London Street Accessibility Tool	characteristics for the section being analysed							ffected by th					· · ·	
v 1.2		EWC	O1. MWC	MS			LC	GD	RS	R HI	ANI	COO AT	DI	Comments
Crossing Point														
														Zebra crossing (note that there is also an access road within this section which is ~12m, with no island.
Crossing Type Crosses Over Edge Marking Tactie Paving Back Edge Tactie Paving Colour Tactile Paving Tonal Contrast Tactile Paving Stem Length Tactile Paving Stem Width	Controlled crossing (any road width) Carriageway (motor vehicles and cycles together) 800 mm deep tactile paving edge marking (full width of flush area) Straight back edge Tactile colour not as per guidance Tactile without significant contrast with surounding paving Tactile stem > 0.5 m from building line Tactile stem 1200 mm width	4 3 2 3 3 3 3 3 3	4 3 3 3 3 3 3 3 2	4 3 4 3 3 3 3 3 3	4 3 3 3 3 3 3 3 3 3	4 3 1 1 3 3 4	4 3 4 3 3 2 4	4 3 3 3 3 2 3 4	4 3 4 3 2 3 3 3	4 3 2 2 2 3 3	4 3 2 3 3 3 3 3 3	4 3 4 3 3 3 4 4	3 4 3 4 3 3 3 3	Within this section which is ~1.2m, with no Island. Unlikely to be high volume of traffic) Should be red? 3 x 400m paving in width
Island Type Island Depth	No island Island depth > 1.2 m	2	3	2	2	2	2	2	3	2 4	2	2	3	
Kerb Drop Slope Kerb Drop Tactile Signal (red/green man) Audible (beeping)	Kerb drop < 1/12, 4.7deg, 8% incline Kerb drop with tactile paving No Signal (zebra) No Audible	3 3 2	3 2 3	3 4 2	3 4 2 2	3 1 3 3	3 3 3 2	3 3 3 3	3 3 3 2	3 3 3	2 3 3 2	3 4 3	4 3 2 1	Note: CoL Standard Details 11 (SD 11) suggest max fall of 1:12, ideal fall of 1:20. Confirm with CoL.
Count Down Tactile Rotating Cone	No count down Rotating cone right side only	2	3	3	3	3	3	3	3	2	3	3	2	
	Notating cone right one only	0	0	0	0		~					0	0	
Surface Material	Smooth York Stone	3	3	3	3	4	4	4	3	3	4	3	3	Good quality footway.
Pattern	Uniform paving colour	3	3	3	3	3	3	3	3	3	3	4	3	All grey. Grey york stone isn't high contrasting against the grey,
Contrast with Road	Lower tonal contrast between paving and road	3	3	3	3	3	3	2	3	2	3	3	3	asphalt carriageway. Double yellow lines along this section, although slightly faded. Whit zig zags on approach to the zebra
Lines	yellow/red/white lines at road edge	3	3	4	3	3	3	3	4	3	4	4	4	crossing.
Kerb Kerb Type (crossing over)	Crossing upstand 0 mm to 3 mm + 800 tactile paving	4	3	1	4	2	3		3	3	1		3	Flush with tactiles.
	Deliniating kerb 100 mm to 150 mm	2	2	4	3	2	3	3	3	3	3	3	3	Flush with tactiles.
Footway Width														
Width	Footway width > 5 m	4	4	4	4	3	2	3	3	4	4	4	4	Footways north of the access road are ~6.8m. Width from building line to the controlled crossing (zebra) is ~9.3m. Although footway widths are >5m in this section, the
Unobstructed Width	Min unobstructed width > 1.5 m	3	3	3	3	3	4	3	3	4	3	3	3	large planters narrow the widths in some places to ~3.2m.
Street Furniture														
Position	Street furniture < 1 m from building line	1	2	2	2	2	2	2	1	1	1	2	2	Lamp columns and cycle parking located adjacent to building line. Planters >1m from building line.
Cafe Tables Temporary Items	No cafe tables No temporary obstructions	4	4	4	3	3	4	3	3	3	4	3	4	
Street Furniture Height	Street furniture > 0.9 m height	3	3	3	3	4	3	3	3	3	3	3	3	Lamp columns, wayfinding signs and planters all >0.9m. Sheffield stands are slightly smaller than >0.9m (~0.8m)
Contrast	Low tonal contrast with paving	3	3	3	3	2	3	2	2	3	3	2	2	Planters and sheffield stands are silver/grey, which are not too dissimilar to the paving (low contrast). Lamp columns and wayfinding signs are black so contrast well. Benches located within the Barbican Estate.
Bench Spacing Bench Design Bench Seat Height	Bench > 400 m away Benches with arms + Backrests Benches seat height 45 to 50 cm	3 3 3	3 3 3	3	1 4 4	0	3 3 3	3 3 3	2	2 4 4	1 4 3	2 3 3	3 3 3	approximately 0.3 miles (480m) away. Additional seating is available at the Finsbury Circus Western Arm, also 480m away.

Bench Sensory Experience	No sensory experience	3	3	3	3	3	3	3	3	3	3	3		3	Although located in the middle of the City, the seating within the Barbican Centre offers a relaxing, pleasant sensory experience (traffic free, planting, water). Finsbury Circus is located adjacent to Moorgate, which is a busy through routes and bus routes. Some greening is present within Finsbury Circus Gardens however.
Slopes Gradient (in direction of travel	0. Or diant + 4/50	0	-	-	-	0	0	0	-	0	-	0		0	Assumption based on google.
Camber (across footway)	Camber < 1/50	3 3	4	3	4	3	3 3	3 3	3	3	4	3		3	Assumption based on google.
Vehicle Access Vehicle Crossover	Organization laurel	0	0	0	0	4	0	4	0	4	0	0		0	
Venicle Crossover	Crossover level Blue badge parking 100 m to 500 m away	3	2	3	2	4	2	3	2	4	3	3		2	Two disabled parking bays are present outside Salters' Hall on Fore Street, roughly 200m from the zebra crossing.
Taxi Drop Off Location	Taxi drop off within 10 m Taxi drop off kithin 10 m	4	4	33	4	4	4	4	4	4	4	4		4	Taxi rank is located 160m from the zebra crossing (outside 28 Ropemaker Street). Taxis are also permitted to drop off on double yellow lines on Moor Lane. Low height kerb along length of bay.
Dedicated Taxi Drop Off Bus Stop Location	Dedicated taxi drop off point / taxi rank 250 m to 500 m away	3	3	4	4	4	3	3	4	3	4	4		4	Bus stop located on London Wall is ~320m from the zebra crossing (south). Another bus stop, located on Chiswell Street, is also located ~320m from the zebra crossing (north).
Bus Stop Kerb Height	125 mm to 140 mm	3	4	3	4	4	3	3	3	3	4	3		3	
Bus Stop Type	Flag only	3	3	2	3	1	3	3	3	1	3	2		2	Both the London Wall and Chiswell Street bus stops are flag only. Note that the bus stop on the southern side of London Wall has shelter and perch seat.
Toilets															
Accessible Toilets	100 m to 500 m away	3	3	3	3	2	3	3	4	3	3	3		4	Accessible toilets are available at El Vino Alban Gate which is located 0.3 miles (480m) away. Changing Places toilets are available at the Barbican Centre Beech Street, 480m (0.3 mile) from the Moor
Changing Places Toilets	Within 500 m	3	4	3	3	3	3	3	3	3	3	4		4	Lane junction with Fore Street https://www.changing- places.org/find
Published September 2022	The City of London Street Accessibility Tool (CoLSAT) was developed by Ross Atkin Associates and Urban Movement for the City of London Corporation.	1	Ross Atki Asso									U m	irba ^{noveme}	n nt	

COLSA T	Step 1 Set each of the drop downs below to best describe the street characteristics for the section being analysed	Step 2 Review t		or each nee	ds segmen		e cursor ove gment are al			core to read	quotes exp	aining how	participants	
v 1.2		EWC	MWC	MS			LC	GD	RS	× HI	ANI	COO AT	DI	Comments
Crossing Point														
Crossing Type Crosses Over	Controlled crossing (any road width) Carriageway (motor vehicles and cycles together)	43	4	4 3	43	4	43	4	4	4	4	4	3	No change from existing arrangement. Zebra crossing (note that there is also an access road within this section which is ~12m, with no island. Unlikely to be high volume of traffic)
Edge Marking Tactie Paving Back Edge	800 mm deep tactile paving edge marking (full width of flush area) Straight back edge	3	3 3	4	3 3	1 1	3	3 3	4	3	3	4	3	Proposals include providing appropriate tactiles at the access road.
Tactie Paving Colour	Tactile colour not as per guidance	3	3	3	3	3	3	3	3	2	3	3	3	Should this be red at the controlled crossing i.e. zebra? No change from existing arrangement.
Tactile Paving Tonal Contrast Tactile Paving Stem Length	Tactile stem > 0.5 m from building line	3 3	3 3	3 3	3 3	3	3	2 3	2 3	2	3 3	3	3 3	Recommendation: tactiles at controlled crossing should be red. No change from existing arrangement. No change from existing arrangement. 3 x 400m
Tactile Paving Stem Width Island Type	Tactile stem 1200 mm width No island	3	2 3	3 2	3 2	1	4	4	3 3	3 2	3 2	4	3 3	paving in width
Island Depth	Island depth > 1.2 m	3	4	3	3	3	3	4	3	4	4	4	3	Note: CoL Standard Details 11 (SD 11) suggest max
Kerb Drop Slope Kerb Drop Tactile	Kerb drop < 1/12, 4.7deg, 8% incline Kerb drop with tactile paving	3	3 2	3	3 4	3	3 3	3	3	3	2 3	3	3	fall of 1:12, ideal fall of 1:20. Confirm with CoL.
Signal (red/green man) Audible (beeping)	No Signal (zebra) No Audible	2 3	3 3	4	2	3 3	3 2	3 3	3 2	3 3	3 2	3 3	2 1	
Count Down Tactile Rotating Cone	No count down Rotating cone right side only	2 3	3 3	3	3	3 3	3 2	3 3	3 3	2 3	3 3	3 3	2 3	
Surface Material														
Surface Type Pattern	Smooth York Stone Uniform paving colour	3 3	3 3	3 3	3 3	4	4	4	3 3	3 3	4	3	3 3	Footway's will be repaved. All grey. No change from existing arrangement. Grey york stone isn't high contrasting against the grey, asphalt
Contrast with Road	Lower tonal contrast between paving and road	3	3	3	3	3	3	2	3	2	3	3	3	carriageway. Double yellow lines will be repainted along this section. Recommendation: review white zig zags on
Lines	yellow/red/white lines at road edge	3	3	4	3	3	3	3	4	3	4	4	4	approach to zebra crossing.
Kerb Kerb Type (crossing over)	Crossing upstand 0 mm to 3 mm + 800 tactile paving	4	3	4	4	2	3	4	3	3	4	3	3	No change from existing arrangement. Flush.
Kerb Type (moving alongside)	Deliniating kerb 100 mm to 150 mm	2	2	3	3	3	3	3	3	3	3	4	3	······································
Footway Width														
Width Unobstructed Width	Footway width > 5 m Min unobstructed width > 1.5 m	4	4	4	4	3 3	2	3 3	3 3	4 4	4	4	4	Footway widths on western side likely to reduce due to implementation of the planters/rain gardens and cycle parking - CoL to confirm widths. CoL to confirm widths.
Street Furniture														
Position Cafe Tables Temporary Items	Street furniture < 1 m from building line No cafe tables No temporary obstructions	1	2	2 4 4	234	234	2	234	1	1 3 4	1	23	2	Lamp columns and cycle parking located adjacent to building line. Planters >1m from building line (TBC CoL).
Street Furniture Height	Street furniture > 0.9 m height	3	3	3	3	4	3	3	3	3	3	3	3	Lamp columns and wayfinding signs all >0.9m. Sheffield stands are slightly smaller than >0.9m (~0.8m). CoL to confirm height of planters (almost certainly >0.9m)
Contrast	Low tonal contrast with paving	3	3	3	3						2	2	2	Lamp columns and wayfinding signs are black so contrast well - these will be retained. Recommendation: ensure rain gardens/planters and sheffield stands contrast with paving.

Bench Spacing Bench Design Bench Seat Height Bench Sensory Experience	Bench > 400 m away Benches with arms + Backrests Benches seat height 45 to 50 cm No sensory experience	3 3 3 3	3 3 3 3	3 4 3	1 4 4	0 4 3	3 3 3 3	3 3 3 3	2 4 3	2 4 4 4	1 4 3	2 3 3 3	3 3 3 3	No proposals for additional seating. Recommendation: the addition of seating at the edge of the rain gardens could also be considered to capitalise on the public realm improvements and shading associated with the greening. Benches located within the Barbican Estate, approximately 0.3 miles (480m) away. Additional seating is available at the Finsbury Circus Western Arm, also 480m away. Although located in the middle of the City, the seating within the Barbican Centre offers a relaxing, pleasant sensory experience (traffic free, planting, water). Finsbury Circus is located adjacent to Moorgate, which is a busy through routes and bus routes. Some greening is present within Finsbury Circus Gardens however.
Slopes														
Gradient (in direction of travel Camber (across footway)) Gradient < 1/50 Camber < 1/50	3	4	4	4	3	3	3	4	3	4	3	3	Assumptions based on google. Assumptions based on google.
Vehicle Access				Ū		0	Ū	Ū		0				, coumptione zacou en google.
Vehicle Crossover	Crossover level	3	2	3	2	4	2	1	2	4	3	3	2	-
														Two disabled parking bays are proposed ~90m south of the zebra crossing. Two disabled parking bays are present outside Salters' Hall on Fore Street, roughly 200m from the
Blue Badge Parking	Blue badge parking Within 100 m	4	3	3	3	3	3	3	3	3	3	3	3	zebra crossing. Taxi rank is located 160m from the zebra crossing (outside 28 Ropemaker Street). Taxis are also permitted to drop off on double yellow lines on Moor
Taxi Drop Off Location Taxi Drop Off Kerb Dedicated Taxi Drop Off	Taxi drop off within 10 m Taxi drop off kerb > 150 mm Dedicated taxi drop off point / taxi rank	4 4 3	4 4 3	3 3 4	4 3 4	4 2 4	4 3 3	4 3 3	4 3 4	4 3 3	4 4 4	4 3 4	4 4 4	Lane. Low height kerb along length of bay.
Bus Stop Location	250 m to 500 m away	3	1	0	2	1	2	3	3	1	1	3	3	Bus stop located on London Wall is ~320m from the zebra crossing (south). Another bus stop, located on Chiswell Street, is also located ~320m from the zebra crossing (north).
Bus Stop Kerb Height	125 mm to 140 mm	3	4	3	4	4	3	3	3	3	4	3	3	Both the London Wall and Chiswell Street bus stops
Bus Stop Type	Flag only	3	3	2	3	1	3	3	3	1	3	2	2	are flag only. Note that the bus stop on the southern side of London Wall has shelter and perch seat.
Toilets														
Accessible Toilets	100 m to 500 m away	3	3	3	3	2	3	3	4	3	3	3	4	Accessible toilets are available at El Vino Alban Gate which is located 0.3 miles (480m) away. Changing Places toilets are available at the Barbican Centre Beech Street, 480m (0.3 mile) from the Moor
Changing Places Toilets	Within 500 m	3	4	3	3	3	3	3	3	3	3	4	4	Lane junction with Fore Street https://www.changing- places.org/find
[
Published September 2022	The City of London Street Accessibility Tool (CoLSAT) was developed by Ross Atkin Associates and Urban Movement for the City of London Corporation.	r	Ross Atki Asso									U 	rban ovement	



pedestrians from all walks of life Easy to cross Clean air 100 90 shade and shelter People feel ^{related} 80 70 50 40 30 20 10 Things to see and do Places to stop and rest People feel safe Not too notsy Number of 'zero' scores People choose to Existing layout: 1 Proposed layout: 1 Source: Lucy Saunders

Healthy Streets Indicators' scores (%)

(Results will only display once all metrics have been scored)

Pedestrians	from all walks of life
Easy to cros	S
Shade and s	shelter
Places to st	op and rest
Not too noi	sy
People choo	ose to walk, cycle and use public transport
People feel	safe
Things to se	ee and do
People feel	relaxed
Clean Air	
Overall Hea	Ithy Streets Check score
Number of	'zero' scores
(Proposed la	ayout score from applicable metrics)

Existing	Proposed
layout	layout
67	69
81	85
22	50
33	50
67	73
67	80
67	69
70	74
70	74
56	67
68	71
50	67
67	71
07	(1
1	1
-	0.000/
	8.33%

Page 232

This page is intentionally left blank

Committees: Operational Property and Projects Sub - for decision Streets and Walkways Committee - for decision	Dates: 3 rd July 2023 4 th July 2023
Subject: Aldgate Highway Changes and Public Realm Improvements Unique Project Identifier: 9423	Gateway 6: Outcome Report Complex
Report of:Executive Director EnvironmentReport Author:Daniel Laybourn, City Operations	For Decision
PUBLIC	

<u>Summary</u>

1.	Status update	Project Description:
		The objective of this project was to remove the 1960's era Aldgate four lane gyratory system and create a new high quality public square. In addition to transport and air quality improvements, this project also supported regeneration of the area and created a new destination in the City.
		To help reduce vandalism and anti-social behaviour, as well as enlivening the new space, it was agreed that a new pavilion with catering facilities and publicly accessible toilets would also be introduced within the new Aldgate Square (the associated Aldgate Pavilion project was formally closed in December 2020).
		RAG Status: N/A (project complete)
		Risk Status: N/A (project complete)
		Risk Provision Utilised: N/A (project pre-dates the requirement for a formalised costed risk provision)
		Final Outturn Costs: £17,924,253

2. Next steps		Requested Decisions:
	and requested decisions	Members of Streets and Walkways and Operational Property and Projects Sub-Committees are asked to:
		 Note and approve the content of this outcome report; Authorise Officers to complete the final account for the project; Note that the unspent Section 106 funds are to be reallocated to other projects in accordance with the requirements of their related legal agreements and a separate report will be brought to Members that sets out details of the proposed reallocations; and Agree to close the project.
3.	Key conclusions	The Aldgate Highways and Public Realm project, that began in 2012, was substantially completed in 2018 when it opened for public use alongside the nearby Pavilion. Whilst the scheme was substantially completed on time and within the agreed budget, small issues with snagging, resurfacing and the marking out of the London Wall meant work was fully completed by March 2022. This was the largest project ever undertaken by the City's Environmental Department and it successfully delivered its project outcomes. Also, Aldgate Square was shortlisted for nine awards, winning five of them:
		 National Urban Design Awards 2018 - Public Sector National Air Quality Awards 2018 - Local Authority & Public Sector Air Quality Initiative of the Year Highways Award 2018 - Most Innovative Highway Authority Scheme of the Year Civic Trust Awards 2019 - Commendation for Civic Trust Award and Commendation for Universal Design. Local Authority Building Control 2019 Awards - Winner of the Best Public Service Building Regional Award 2019 for the Portsoken Pavilion.
		The key to the project's success was due to early, thorough and well-planned engagement with stakeholders such as The Aldgate School (previously Sir John Cass Primary), St Botolph Without Aldgate Church and Transport for London (TfL), amongst many others. This enabled officers to establish the needs and aspirations that helped to shape the overall vision of the project. The successful delivery of what was a very complex highways construction project would not have been possible without the on-going support and collaboration of all the stakeholders involved, both externally and internally through Members.

The project also highlighted the benefit of creating a dedicated project team from a range of teams to focus on a single project. The core project staff also operated in a wider internal resourcing matrix that allowed them access to the relevant experience and knowledge from colleagues when needed. This was a very collaborative approach that involved all impacted departments.
As would be expected with the scale and scope of the changes to be delivered, issues did arise. These are explored in this report, but each of these were able to be overcome by close partnership working with the clients, contractors and internal and external stakeholders.
With high-quality materials and a complex design, the finished scheme has already and will continue to act as the prime example of what can be achieved in delivering public realm change in the City of London, along with the lessons learned and new ways of working established by the project. The successful elements of this project's delivery have been embedded into the All Change at Bank and St Pauls Gyratory projects amongst others.

<u>Main Report</u>

Design & Delivery Review

4. Design into delivery	The Highways and Public realm design has achieved all the desired outcomes and benefits set for the project. The good working relationship between the City's Project Management and Highways teams and the previous term contractor (JB Riney) was especially important when design and construction activities were taking place simultaneously. There was also a substantial number of stakeholders associated with the project, and their expectations were successfully accommodated to meet their needs. However, there were some significant issues. The separation of the Pavilion and Highways/ Public Realm projects at the design phases led to issues in the construction stages of both projects and some elements of the project could now be seen to be over-specified. The project made use of a Project Board which pulled together internal and external stakeholders. Transport for London were a
	key member of this board, not only in terms of the funding they were able to provide through their Major Projects finance stream but also in terms of coordinating inter-related projects and assisting in their approval process.

	Up to Gateway 3 there were 12 working groups to manage specialist areas of the project including movement analysis, structures, environmental factors, public realm, assessment of subway reuse, liaison with development sites, consideration of the traffic and environmental zone, project management and production of a detailed business case. A high level of data collection and analysis was also undertaken prior to Gateway 3. This was used to validation the traffic model and used to inform decision making on key elements of the project. This also formed a baseline to test options against and used to determine the schemes success post completion. There was a push to get the project on site due to need to get started ahead of the TfL Cycle Superhighways project being constructed nearby. This meant that when the project was started on site there was no confirmed design for the entire extent of the project, and design packages for areas were being constantly reworked alongside the construction of earlier phases. This put a lot of pressure on the project team, particularly the design engineers and introduced a lot of risk relating to costs. Several late design changes were required, this was accepted as a less than ideal approach to take but the project would have been substantially delayed otherwise. This risk was accepted through the relevant Committee reports.
5. Options appraisal	 The main aim of the project was to deliver transformational change, remove barriers to movement and provision of public realm amenity to attract investment to the key opportunity area and encourage regeneration. At Gateway 2, the project was estimated at £6.5-7m. At Gateway 3 the initial highways design work resulted in an extension in scope presented across three different options being put to Members on the basis that the additional investment was essential (and affordable) to deliver such a high-quality public space alongside the desired changes to the road network. This increased the estimated cost range to £7-£12m. Subsequently, the core project approved by Members at this stage involved: Conversion of Aldgate High Street and St Botolph Street to accommodate two-way traffic; The creation of a new public square between the Aldgate Primary School and St Botolph Without Aldgate Church; and Replacement of the subway access points with controlled crossings at surface level.

	 Re-landscaping the adjacent churchyard at St Botolph Aldgate to ensure step-free access and integration with the wider design.
	A more detailed concept design was then presented to Members for approval in October 2013 which increased the project range to $\pounds 16.3 - \pounds 17.1m$. This followed the undertaking of more technical work and public consultation which focussed work on one feasible option. With the report being approved, work then focussed on developing this design.
	By the Gateway $4/5$ in June 2014, the total estimated construction cost had increased to £17.1 - £19.5m. The medium specification was the recommended option which was subsequently approved. This then set the budget cap for construction at £18.67m.
6. Procurement route	Early concept designs and movement strategies were completed by external consultants following the standard procurement route. Subsequent detailed design work was undertaken 'in-house' by the City's various teams. The City's previous term contractor, JB Riney, was then used to deliver most of the project, with the City's Open Spaces team undertaking the greening elements.
	At times, specialist external expertise was contracted to undertake design and construction work, such as Rupert Harris, who undertook historic restoration work, and Fountaineers, who installed and commissioned the two water fountains and their pump system.
7. Skills base	The Project Team had the skills, knowledge, and experience to manage and deliver the project. As mentioned in section 6, external specialists were contracted by the project team to provide specific expertise when and where needed. The team was pulled from a range of internal teams in the City including Transport, Highways and Open Spaces. With their focus being on one project, it allowed them to work effectively and efficiently as a team, and deal with any issues promptly. However, the size of the team given the scale of the project could have, at times, been deemed to be too small. This manifested itself when team members had to take on some responsibilities that would have been better allocated to staff who had more experience in those areas or as specific external secondments (Highways engineers undertaking structures work being one example). This was further compounded by the scheme going into construction without a fully completed design.
v April 2010	Also, in hindsight, there was an overreliance on a small number of officers. This could have been a problem should any of the key

	staff left during the project. The project was fortunate enough to have not suffered these issues, but as far as possible, efforts should be made to limit the impact of this risk for similar future projects.
8. Stakeholders	Project Board The Aldgate Project Board was established at Gateway 2. This included representatives internally from the City of London, an officer from London Borough of Tower Hamlets, a local developer (Minerva) and Transport for London. This was a useful forum to establish support both in terms of design assistance and funding from Transport for London. Alderman Bear was the Ward representative on this group.
	Public Consultation With the project scope over a large and diverse neighbourhood area, it was vital that all Aldgate stakeholders felt heard and engaged with fairly. The length of the scheme meant a project identity/brand was important to bring familiarity and consistency. This ensured project communications were distinguishable from the various other mailers and signage in the area. To this end, a colour template, font, and logo, as well as a standard for displaying high quality and detailed montages of the project's vision, was specifically developed. These were all utilised for the entirety of the project and were especially helpful at tying together the planned utility and road diversion booklet, e-bulletins, mailed items, consultations, and events.
	Officers also commissioned a video to highlight the area prior to the scheme starting construction capturing stakeholder's perception through interviews and a survey. Furthermore, identifying several City Corporation Members as local 'champions' for high profile engagements including project milestones, provided further consistency for community involvement. Road user and disability groups were convened to provide detailed feedback at various workshops prior to public consultation. These groups along with local stakeholders were regularly engaged with in person and invited to project events to ensure they directly felt a part of the transformation that the project delivered.
	In addition to traditional methods of promoting the statutory consultation, the project held several on-street engagement events to keep the community informed. The Aldgate School was involved with regular road safety days, art projects as well as having the honour of being the first visitors to Aldgate Square pre- and post- construction. London Metropolitan University also held a

competition to design a piece of street furniture to be featured in Aldgate.
Another popular element of stakeholder engagement was highlighting the vibrant and long history of the area at the start and end of the project. Large panels around the site highlighted historical artefacts found at the initial stages of the project, and this was followed at the end of the project with a book containing a compilation of history articles which were in the weekly project newsletters, attracting over 1000 readers every week.
When the enhancements and construction was completed, several events were held for various stakeholders within the community to come together to see the positive and direct impact their feedback and comments made to the final project. Several display towers were placed around the project area to further highlight the before and after impacts of various areas to the public.

Variation Review

9. Assessment of project against key milestones	 At Gateway 3 the following milestones were set: G4 report by Autumn 2013 G5 end of 2013 Implementation to start 2014 for period of 12-18 months. The G5 report was subsequently submitted approximately 6 months later than planned as the G3 estimate was overly optimistic. However, work did start as planned in 2014. During construction, the progress of the interlinked Pavilion project had a fundamental impact on the progress of the public realm work in the later stages of construction. The more-recent delays in delivering some carriageway resurfacing work (due to required availability of the City road network) and confirming the demarcation of the Roman London Wall that would satisfy the scheduled monument consent, resulted in the project technically overrunning by approximately 18 months. However, it's important to note that all the benefits of the project were achieved when Aldgate Square opened in Summer 2018.
10. Assessment of project against Scope	At Gateway 2 it was expected that the scheme would be focussed on the gyratory removal and public square, and the project budget at this stage was £7m. The subsequent scope change is detailed in section 11 but in short, through the outline design process, it was realised changes further away on the highway network would

	be needed. These were added to the scope in the Gateway 3 report.
	Additional elements were added in because of the public consultation exercise which resulted in demand for water features and improvements to the Churchyards and gardens. The inclusion of what was initially envisaged to be a kiosk, which then became an architecturally designed centrally located café, was the single biggest element of scope change. Although separate to the highways project this report relates to, it had significant ramifications on it which needed to be accounted for.
	Arts, Events and Play, a funded activation programme intended to activate the new public space, was eventually removed from the project scope when the Aldgate Bid started to form. Officers felt that this offered better on-going continuity for the space's utilisation, especially when the project ended.
11.Risks and issues	The project commenced prior to the costed risk process being in place. However, a robust risk management process was in place throughout the course of the project and it's this that has led to the eventual approx. £750,000 saving. Due to this and despite the scale of the highways and public realm project, the number of issues incurred was relatively small and generally related to the project adapting to external influencing factors such the Pavilion and procurement factors/ issues.
	The risks identified early in the project related to third party approvals (London Borough of Tower Hamlets and Transport for London primarily). This project was developed before the recent changes to funding requirements which now requires this to be confirmed at Gateway 2. The provision of full funding for the project was therefore an ongoing high risk up to Gateway 4c.
	The project also had a high level of technical requirements – including London Underground structures under Aldgate High Street, reuse of the subways, foundation requirements for the Pavilion and elements of the public realm such as the fountains which were all highlighted as risks as the design progressed through the gateways. Furthermore, the Section 278 project around the Dorsett Hotel was a major risk that required additional engineering work. Coordination with other projects including Transport for London's cycle superhighways project was also a key risk. This drove the programme into needing to be on site by Summer 2014 and therefore having to be constructing some works packages whilst still designing others. Despite best efforts with all statutory undertakers early in the project, further reprogramming

	was required when nearby National Grid upgrade works incurred some issues which impacted to time and cost.
12. Transition to BAU	BAU maintenance responsibilities have now been successfully passed over to the City's Highways Maintenance, Street Cleansing and Open Spaces teams. Funding for the on-going maintenance commitments formed part of the project in the form of a commuted sum.

Value Review

13.Budget						
			Estimate Pavilion	nted cost – £6.5-7m (excluding n)		
		Description		Approved	Spend	Balance
		Pre-evaluat	ion costs	2,773,653	2,773,653	0
		Work*		12,455,404	12,114,969	340,435
		Staff Costs		2,392,704	2,234,366	158,339
	Highways & Public Realm	Fees		967,593	778,110	189,483
	Public Realm	Purchases		25,640	23,155	2,485
		Contingenc	y	59,378	0	59,378
			Totals	18,674,373	17,924,253	750,120
	Pavilion					
	(separate	(All co	osts)	4,621,139	4,548,676	72,463
	project)					
	Grand Total * Includes approx.			23,295,512		822,582
	For more detail Transport for Lo which was deta	, please see ondon provi	e Append ded appro	l ix 1. It shou bx. £8m of fi	uld be noted	
	Please confirm whether the Final Account for this project has been verified – They have not been verified as of 16/05/2023. It is requested to undertake the final account following approval of this G6 report which will include the reallocation of unutilised Section 106 funds to other projects in accordance with the requirements of their related legal agreements, and a separate report will be brought to Members that sets out details of the proposed reallocations.					
14.Investment	Not applicable.					

15. Assessment of project against SMART objectives	 The project met its success criteria which was set before measurable objectives were part of the project processes. These were listed as the following: Creation of the public square and the improvement of the appearance/amenity of the area Improvement of mobility (for all modes) through the area Improved rental values and development of disused sites Improved satisfaction rates for all users of streets and spaces All options presented at Gateway 3 accommodated the following objectives:	
	 Barriers to movement reduced for all vulnerable road users Generate interest for development in the area Improve road safety and the perception of road safety Improvements to Air Quality – particularly at the school Improved public safety and a possible decrease in anti-social behaviour by the removal of the subways from public use 	
16. Key Benefits realised	Whilst it's not generally possible to quantify the project's benefits (due to it predating the requirement for measurable objectives), the project did achieve its success criteria as explained in Section 15. However, it was possible to quantify the air quality improvements at the Aldgate Primary School. As can be seen in Appendix 3, the air quality substantially improved around the school where it had previously been noted to be very poor.	

Lessons Learned and Recommendations

17.Positive reflections	Overall, the project has achieved all its aims and objectives, winning five awards in the process. It has also made a budgetary saving of £822,582, and pedestrian safety and air quality in the area have improved substantially following the highways alterations becoming operational in 2015. As a result of the project's success, external organisations have been in contact with the project team so that they could learn of the best practice & methods and lessons learnt. Recently the Aldgate BID undertook their own survey work which received very complimentary and positive feedback on the Square.
	The project was an example of successfully embedding support for significant change through Aldgate and Tower Area Strategy in 2011/2012 which then fed into the project's planning. This bought in support from developers in the area alongside more established stakeholders.

The highways design taken forward into construction was later found, by Road Safety Audit, to contain very few issues that needed resolving once it had become operational. Given the scale of change involved, this has highlighted the City's Environment department's ability to successfully design and deliver such a project. Furthermore, the public realm's design including the water features and greening were highly praised by all stakeholders, with the attractive green space and seating in the Square often being full of people having their lunch and the 'jumping jets' fountain constantly being photographed by passers-by, especially during the Spring and Summer. The flexibility of the Square has also been proven, with various events having taken place there such as the Christmas Markets and pop-up events amongst others. The dedicated Project staff and Engineers, the principal and other external contractors all worked well together throughout the project, ensuring the work was completed in less-than-ideal conditions at times. This is especially noteworthy given the small size of the team and the size of the project. Also, the small size of the team enabled quick and effective communication as generally each person acted as single point of contact for the topic being discussed. Weekly team meetings, chaired by the Project Manager, were also found to be particularly useful in keeping all those involved at the time updated on what was happening across the project. As mentioned previously, the well-executed engagement, codesign process with stakeholders and the use of an overarching project board throughout the project ensured they were fully consulted, kept up to date on progress and provided a forum for all to discuss their requirements. This therefore helped to inform the highways design to ensure it successfully met with all their expectations. Further funding was granted to the project by TfL because of the good working partnership that was established, which also enabled there to be some rescheduling of work to let TfL progress with its nearby Cycle Superhighway projects without delaying the Aldgate project. Significant surveys were undertaken at Gateway 3 stage including topographical and GPR surveys, data collection around parking, loading, coach activities, movement analysis, cellar surveys, trial pits for signal design. This allowed design decisions around options to be clearly appraised. Because of the significant changes to the highway layout, there was early engagement by the Project Engineers with impacted utilities companies to see if they could bring any planned works forward to mitigate potential issues in future. This was an effective precursor to the formalised process then being undertaken by the City's Streetworks team.

	Regarding day-to-day operations, forward planning for Aldgate Square's transition into BAU started very early on in the project, successfully resulting in a revenue budget being set aside at the project's early stages to account for future BAU cost uplifts. This work allowed for the full financial impact of proposals for the Square's design to be assessed at an early stage, and would have allowed for the project's scope to be altered should it have been required.
18.Improvement reflections	 Several lessons learnt sessions were held following the substantial completion of the public space in Summer 2018, and the comments from these have been consolidated into the list below. It should be noted that some of these items, outside of the control of the project team, have already been addressed since the list was compiled: <u>Governance</u> Lack of delegation to Officer level in the governance structure of the project restricted the ability to deliver at pace. Roles/responsibilities should be outlined clearly at the start of projects, so all stakeholders are clear of their remit within the project; Terms of reference are essential for major projects to ensure there is clarity on who is responsible for final decisions; Offline briefings are not the preferred option for decision making as it becomes difficult to track what was agreed formally and where; The above can causes issues as not all stakeholders are always aware of decisions made; Alternative governance specifically for larger projects could be considered such as having its own governance board or committee (with Member representation for quicker decision making); Organograms should be produced for sharing with partners to clarify roles and responsibilities; Implement a fixed change control sheet to capture changes to scope/budget throughout the process, and use this to provide an overview of state of play/key issues to be aware of; Standardised/ uniform formats of reporting should be used to ensure everybody is reporting in the same way to Members and Committees;

 Departmental SLA's for clear remits and responsibilities; and Closer scrutiny on the agreed specification to ensure everybody agrees what is being delivered.
 Project Assurance/ Risk Project Assurance is an important element in major projects and should be part of the project set-up; There should be a cross-departmental view of organisational capability to ensure the Corporation is equipped to deliver what is required before embarking on major projects; Guidance on how much risk the Members are willing to tolerate/what they are comfortable delegating to Officer level is needed. (pre-dates costed risk provision)
 Procurement The City needs to empower projects and BAU operations to more easily say that contractors are not capable of fulfilling their obligations and terminate if appropriate; Procurement method chosen did not offer the best value or competition (chosen via SCAPE framework due to urgency), and competitive tendering may have been more a better option; and External contractors and third parties should be liaising with a single point of contact.
 Design & Construction Design and construction activities overlapped somewhat which led to difficulties in managing processes that were in constant flux. More detailed design work should have been undertaken at Gateway 3 to understand the feasibility and likely design costs of the project. We now understand better the process needed to deliver these types of projects and more recent projects such as Bank Junction have had a lot more detailed worked undertaken before presenting options to members. All detailed design work should have been given more time to be fully explored and resolved. Due to time constraints, this didn't always happen. However, at the same time, due consideration was not given early enough to parts of the public realm which meant their delivery was needlessly prolonged (i.e. the demarcation of the Roman London Wall through the space).

	 did introduce a risk that the design would need to be amended. Elements of the design could be considered to be overspecified, such as the Christmas tree base, water fountains, and coloured lighting systems which were specified with third-party events in mind but interest has never reached levels that justify the capital expenditure on such items. On the other hand, some elements were found to be underspecified such as the electricity supply to the Pavilion. Use of the disused pedestrian subways under Aldgate to contain various apparatus for the Pavilion and water fountains was not the most cost-effective or efficient method of housing this equipment. The separation of the complicated Pavilion project from the main public realm & highways project did not work and led to many issues that could have been overcome more easily if both projects were managed by the same team. Furthermore, having two principal contractors working on two different projects in the same space did not work well during the construction phase and became especially difficult to manage, requiring constant programme revisions on both sides to not impede progress.
	wider reach than the project team or the Environment Department such as in the project assurance and risk section have improved since the implementation of this project and continue to be reviewed within the Corporate Project Governance review that is currently taking place.
19. Sharing best practice	Dissemination of information through team and project staff briefings has taken place.
20. AOB	The project predates the requirement for project coversheets. Therefore, none are included in the appendices of this report.

Appendices

Appendix 1	Finance Information
Appendix 2	Long term reduction in nitrogen dioxide at Sir John Cass Foundation Primary School, 2003 to early 2018
Appendix 3	Photo Compilation

Contact

Report Author	Daniel Laybourn
Email Address	Daniel.laybourn@cityoflondon.gov.uk

This page is intentionally left blank

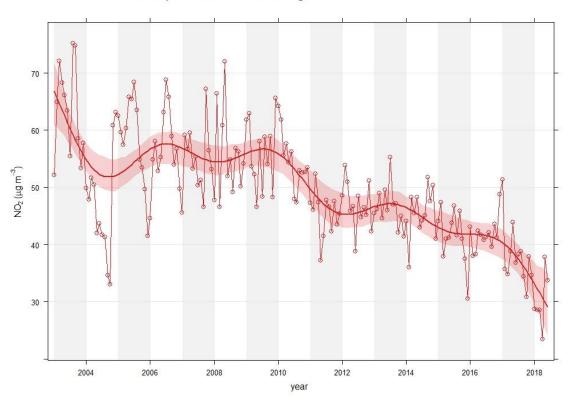
Table 1 Spend to date							
Project	Description	Approved (£)	Spend (£)	Balance (£)			
	Contingency	59,378	0	59,378			
	Evaluation - Fees	459,026	459,026	0			
Highways & Public Realm	Evaluation - Staff Costs	2,314,627	2,314,627	0			
	Fees	967,593	778,110	189,483			
	Purchases	25,640	23,155	2,485			
	Staff Costs	2,392,704	2,234,366	158,339			
	Work	10,662,891	10,620,292	42,599			
	Works	1,792,513	1,494,677	297,836			
Total Highways & Public Realm		18,674,373	17,924,253	750,120			
Pavilion	Contingency	1,096	0	1,096			
	Fees	439,450	435,045	4,405			
	Purchases	65,444	63,393	2,051			
	Staff Costs	99,158	99,158	0			
	Works	4,015,991	3,951,081	64,910			
Total Pavilion		4,621,139	4,548,676	72,463			
Grand Total		23,295,512	22,472,930	822,582			

Source	Description	Amount (£)
City Fund	OSPR	3,308,894
Transport for London	TfL LIP Major Scheme Allocation 2011 / 12	30,000
Transport for London	TfL LIP Major Scheme Allocation 2012 / 13	549,000
Transport for London	TfL LIP Major Scheme Allocation 2013 / 14	1,477,825
Transport for London	TfL LIP Major Scheme Bid Step 2 Submission 2014 / 15	6,000,000
Transport for London	TfL LIP Major Scheme Bid Step 2 Submission 2015 / 16	1,400,000
Section 106	S106 - Heron Transportation Improvements Payment & Uplift	138,368
Section 106	S106 - St Botolphs House Minerva 07/00387/FULL - LEIW / Church Work	216,045
Section 106	S106 - St Botolphs House Minerva 07/00387/FULL - Transport	26,807
Section 106	S106 - 52-54 Lime Street etc 12/00870/FULEIA - Transport	417,654
Section 106	S106 - 60-70 St Mary Axe 08/00739/FULEIA - Transport	296,481
Section 106	S106 - 60-70 St Mary Axe 08/00739/FULEIA - LEIW	735,752
Section 106	S106 - Mitre Square 13/01082/FULMAJ - Transport	270,660
Section 106	S106 - 51 Lime Street 04/00878/FULEIA - Transport (S106 Lime Street Subj 88666)	59,020
Section 106	S106 - 6 Bevis Marks 09/00450/FULMAJ - LEIW	279,304
Section 106	S106 - 120 Fenchurch 11/00854/FULEIA - LEIW	1,345,392
Section 106	S106 - 51 Lime Street 04/00878/FULEIA - LEIW (S106 Lime Street Subj 88666)	293,835
Section 106	S106 - 122 Leadenhall 04/00111/FULEIA - Transport	745,958
Section 106	S106 - St Botolphs House Minerva 07/00387/FULL - LEIW	1,031,766
Section 106	S106 - 6 Bevis Marks 09/00450/FULMAJ - Transport	83,648
Section 106	S106 - Mitre Square 13/01082/FULMAJ - LEIW	1,486
Section 106	S106 - 120 Fenchurch 11/00854/FULEIA - Transport	402,363
Section 106	S106 - Dashwood House 06/00240/FULL - LEIW	6,184

Total	•	£22,472,930
Section 278	S106 - 20 Fenchurch St 08/01061/FULMAJ	14,615
Section 278	S278 - Heron Tower Highway Works (S&W Feb 2013)	425,572
Section 278	S278 - Heron Tower	350,000
Section 278	S278 - Heron Plaza Deferred Improvement Works	480,000
Section 106	S106 - 40 Leadenhall Street - 13/01004/FULEIA - Transport	885,240
Section 106	S106 - 15-16 Minories - 13/01055/FULMAJ - LEIW	58,258
Section 106	S106 - 52-54 Lime Street etc 12/00870/FULEIA - LEIW	879,015
Section 106	S106 - 100 Minories - 12/00263/FULMAJ - Transport	135,592
Section 106	S106 - Drapers Gardens 08/00940/FULL- Transport	128,194

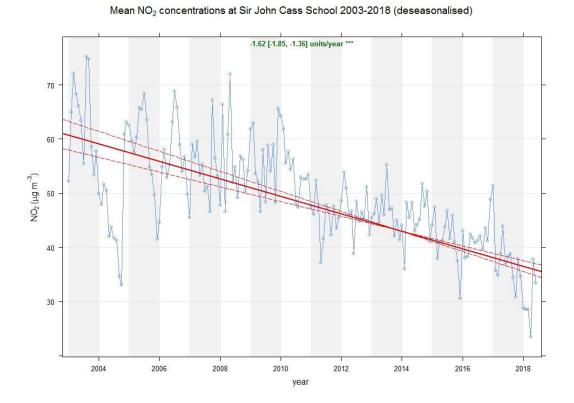
This page is intentionally left blank

Long term reduction in nitrogen dioxide at Sir John Cass Foundation Primary School, 2003 to early 2018



Monthly mean deseasonalised NO2 at Sir John Cass 2003-2018

Further data analysis, below, showing an average reduction of 1.62µgm³ per year from 2003 to early 2018. A similar inner London background site in Westminster has an average 0.82µgm³ per year reduction over the same time period.



This page is intentionally left blank



Aldgate Highway Changes and Public Realm Improvements Project

Project area and masterplan

Aerial photograph of Aldgate Gyratory (before)



Page 2

Aldgate Gyratory before



Aldgate Square - artist impression

Page 2



Aldgate Square completed July 2018

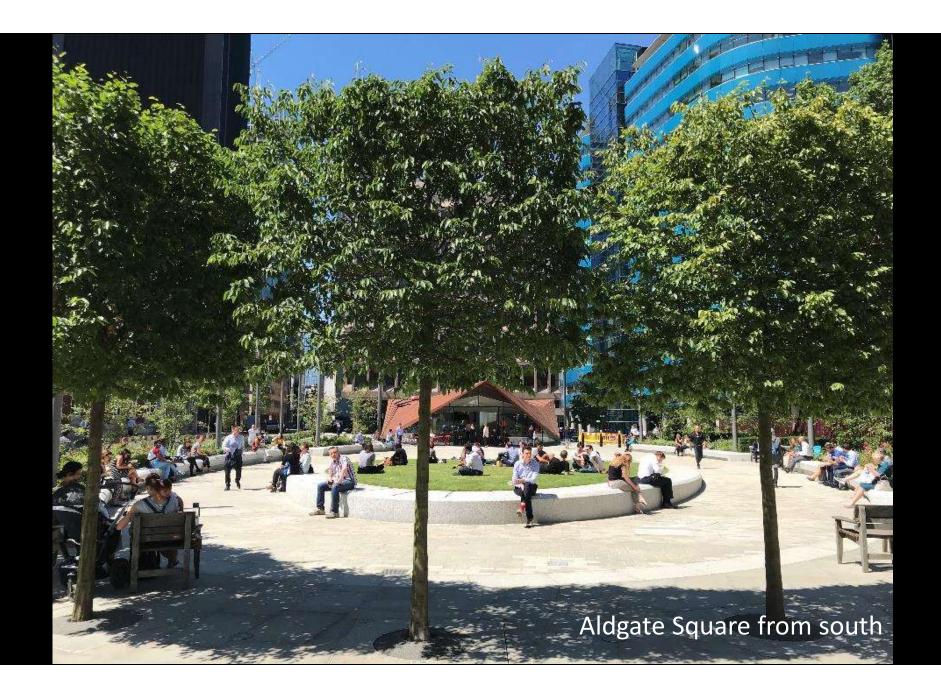


Page 2



Aldgate Square and fountains

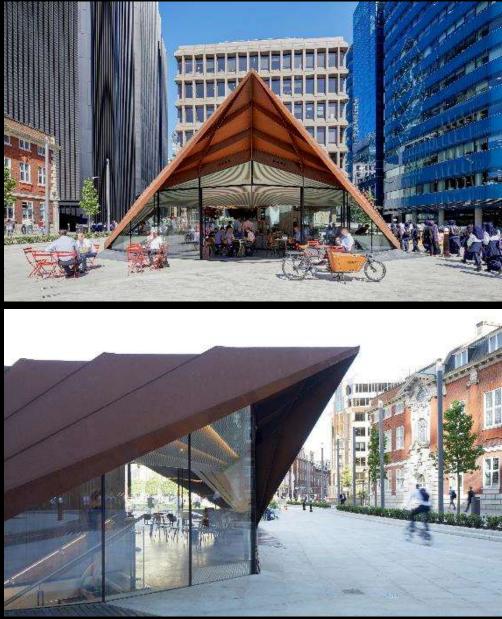




Page 20

Portsoken Pavilion Photographs curtesy of MAKE Architects

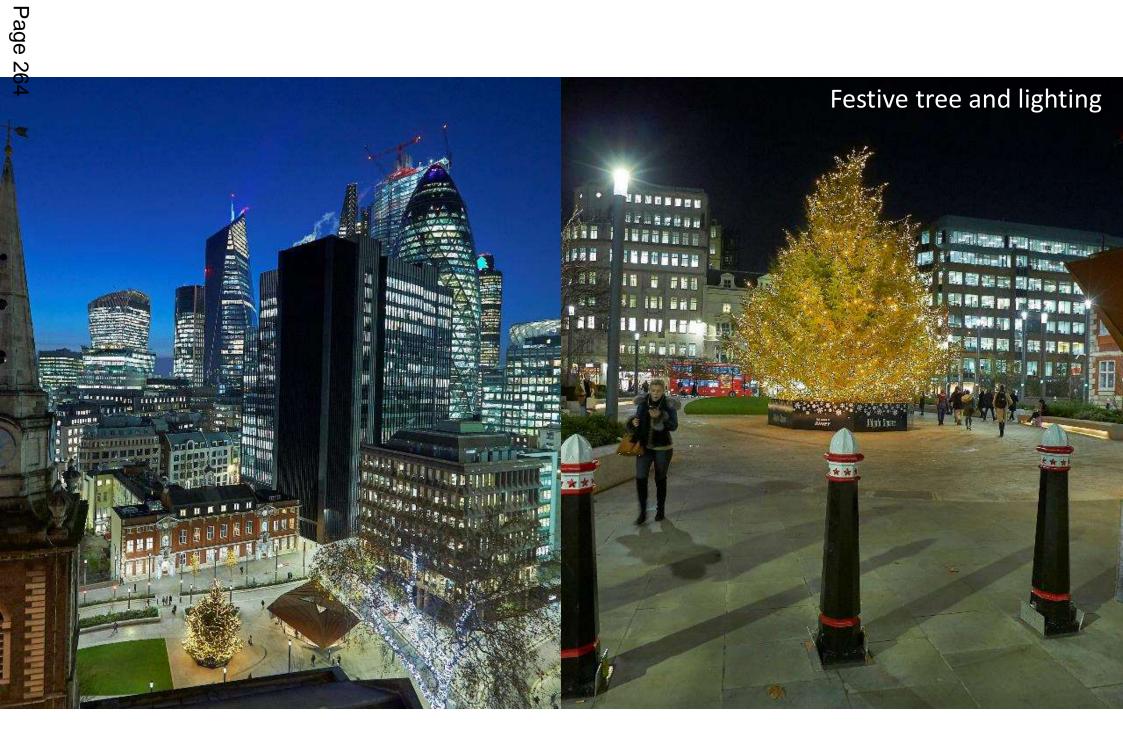






Aldgate highway improvements





Agenda Item 7

Committee(s):	Date(s):
Operational Property and Projects Sub-Committee	3 rd July 2023
- For Decision	
Community & Children's Services Committee	17th July 2023
- For Information Only	
Subject: City Assessment Centre – Procurement Stage 2 Award Report	Public
Which outcomes in the City Corporation's Corporate Plan does this proposal aim to impact directly?	Contribute to a flourishing society: outcomes 1, 2, 3 and 4
Does this proposal require extra revenue? and/or capital spending?	No
If so, how much?	N/A
What is the source of Funding?	DCCS Local Risk
Has this Funding Source been agreed with the Chamberlain's Department?	N/A
Report of: Judith Finlay - Executive Director, DCCS	For Decision
Report authors:	
Mohammad Mostafa, Category Manager, City Procurement, Corporate Services	
John Barker – Commissioning Manager, Homelessness & Rough Sleeping	

Summary

Following a one stage open tender procurement process under the light touch regime Thames Reach have been identified as the preferred agency to provide accommodation and support for the City of London Rough Sleeper Assessment Centre.

Recommendation

To award the contract Thames Reach Housing Association Ltd for a period of three years, with the option to extend for a further two years, at a total value of £2,475,000.

Main Report

Background / Current Contract

- On 20th July 2022, the Stage One Strategy Report for the City of Assessment Centre was presented and approved by the Operational Property and Projects Sub-Committee.
- 2. The service will form a key part of the accommodation pathway for City of London rough sleepers and is integral to the City's commitment to ensure that anyone sleeping rough within the Square Mile is offered a credible route off the streets in line with their strengths, needs and entitlements. This will include supporting the effective operation of the wider accommodation pathway and complimentary commissioned services, engaging and building strong relationships with the wider community (businesses, churches, local residents), maintaining effective partnerships with voluntary and statutory sector services who also have a role to play in supporting or working with service users and maximising available accommodation opportunities.
- 3. The initial timeline outlined in the Stage One report was put back, primarily due to the refurbishment contract for the accommodation being delayed as a result of supply line inflation and the resulting need to re-evaluate refurbishment contract tenders due to rising costs. The refurbishment of the building and the procurement of the support service provider needing to run in tandem.

Agreed Scope / Objectives

4. The service will provide a safe, accessible space for people sleeping rough in the City of London in order that their needs can be assessed and met whilst working with staff on establishing a rapid route away from street homelessness. For many, who will not have a connection to the City of London; this will include reconnection to areas where they are locally connected. The fundamental aim of the service is to identify a credible and sustainable route off the streets and encourage and support each service user to work with the service to take up the resettlement offer that is being made.

Procurement

5. A market warming event was held on 6th June 2022. This was then followed up with a further presentation to market providers on 16th March 2023. This served to refresh provider interest in the upcoming tender opportunity, update them on

the most recent plans and status of the concurrent running refurbishment works to the host building. The market engagement event attracted eight providers in attendance.

6. The tender for this service went live on 6th April 2023. A site visit for potential providers took place on 28th April 2023 and clarifications on the tender were invited up until 5th May 2023 with 48 clarifications received and responded to. The tender closed at 5pm on Friday 19th May. The Capital E-Sourcing Portal used for this tender ensured that it was available to all relevant market providers as well as being advertised on the Governments "Find a Tender" Portal.

Four bids were received from market providers and evaluated on prequalification criteria, technical response including a face-to-face presentation, responsible procurement, and value for money (See Appendix 1).

7. The full evaluation and moderation of all aspects of this tender has resulted in Thames Reach as the preferred provider for this service.

Opening the Scheme

8. Next Steps

With the refurbishment of the building currently underway and targeted for hand over in November 2023. The plan moving forward for this project is as follows:

Provisional Contract Award Notification	10 th July 2023	
10 Day Standstill	10 th July 2023	
Expected Contract Award	24 th July 2023	
Contract Mobilisation	7 th August 2023	
Contract Commencement	November 2023	

The mobilisation period for the successful provider will include such activities as:

- recruitment to relevant positions
- taking handover of the property
- setting up contracts needed to operate the scheme
- establishing partnerships with other services involved in the care and support of those sleeping rough
- establish policies and pathways
- establishing neighbourhood and wider relationships
- setting service standards and Key Performance Indicators

As part of the technical evaluation, the preferred provider has submitted a full mobilisation plan which we will work through with them and monitor their progress towards scheme opening.

There will be opportunities for members to visit to the scheme within this mobilisation period as we move towards handover of the site from the refurbishment contractors. Equally communication to the wider sector and liaison with the local community and neighbourhood will take place in this period with a view to an official opening once the scheme is established.

Corporate & Strategic Implications

9. Strategic implications

None

10. Financial implications

The contract cost is fully funded from within the existing local risk revenue budget.

11. Legal implications

Thames Reach will be expected to comply with the agreed form of Lease and will be expected to allow the City to retain a presence within the premises following practical completion of the refurbishment works. and the Lease being completed. Thames Reach will also have to comply with the terms of the Lease under the contract and must prior to commencement of the services enter into a Statutory Declaration excluding the provisions of Part II of the Leandlord and Tenant Act 1954.

In order to mitigate any data protection risk a Data Protection Impact Assessment is currently being undertaken in accordance with Article 35 of the UK GDPR. Thames Reach use Salesforce as a Sub – Processor who are global. As the City's Data Protection Officer, I am satisfied that there will be no need to enter into an International Data Transfer Agreement assuming the following contractual obligations are agreed: -

- Any City Data must be solely, and exclusively held by the Provider's Sub Processor, Salesforce within a Salesforce Data Centre based in the UK.
- Salesforce's Binding Corporate Rules
- <u>https://www.salesforce.com/content/dam/web/en_gb/www/images/company/salesforce</u> <u>-uk-bcr-february2023.pdf</u>, and which were approved by the Information Commissioner on the 13th February 2023 are an appropriate safeguard in place for the transfer of data in accordance with the provisions of Article 46 of the UK GDPR
- Thames Reach remaining liable for all acts and omissions of Salesforce.

Following the expiry of the 10-day mandatory standstill period under the Public Contracts Regulations 2015 and provided there is no legal challenge to the contract award, further clarification will need to be sought from Thames Reach as to the sub -contractors they intend to use in relation to any maintenance services etc. since the contract terms contain restrictions as to sub -contracting requiring prior approval by the City.

As agreed with the City Surveyor, and in accordance with the terms of the contract, a written instruction will be issued to Thames Reach to commence the services following mobilisation as soon as he is satisfied that the refurbishment works have been completed.

12. Risk implications

The preferred provider, Thames Reach, is on a secure financial footing and an appraisal of their most recent accounts by The Chamberlains Department as part of the procurement process gave no cause for concern. They are very experienced in providing similar services as was tested at pre-qualification and from market knowledge. The 3-month mobilisation timeline mitigates a lot of the risks as it is an adequate length of time to gear up the service, recruit quality staff and management and put partnerships in place with stakeholders.

In terms of other risk, in dealing with a cohort of vulnerable adults, there are a number of risks to be managed, however, these are mitigated by procuring an experienced and capable provider to manage the project and reserving office space within the scheme to ensure City of London officer presence. Risks will be monitored on an ongoing basis via the Contract Management process.

13. Equalities implications

An Equalities Impact Assessment undertaken on the project concluded that the introduction of this Assessment Centre would have a positive impact on vulnerable groups, and that providers need to understand that protected characteristics can all add challenges to vulnerable people accepting a service.

14. Climate implications / Responsible Procurement

Responsible procurement made up 15% of the total evaluation, and was broken down into three subsections, Sustainability, Carbon Reduction and Social Value. Contract Monitoring will involve environmental inspections of properties to ensure that undertakings on the tender are being carried out. The preferred provider has also undertaken to give access to its resources in training, fundraising / communications and access to employment for young people.

15. Security implications

None

Conclusion

16. Seeking approval to award contract to Thames Reach for a value of \pounds 1,485,000 from November 2023 for an initial period of 3 years with the potential to extend for a further 2 years (Total Value \pounds 2,475,000)

17. Seeking approval for the award of any contract extension to be delegated to the DCCS Category Board.

Authors

Mohammad Mostafa, Category Manager, City Procurement, Corporate Services John Barker – Commissioning Manager, Homelessness & Rough Sleeping

Agenda Item 8

 Committee(s): Operational Property & Projects Sub Committee – 	Dated: 03/07/2023
 For decision Finance – For decision 	18/07/2023
Court of Common Council – For decision	20/07/2023
Subject: Increase in contract value - Work and Health Programme - Central London Works	Public
Which outcomes in the City Corporation's Corporate Plan does this proposal aim to impact directly?	2,3 and 8
Does this proposal require extra revenue and/or capital spending?	No
If so, how much?	N/A
What is the source of Funding?	Department for Work and Pensions, UK Shared Prosperity Fund
Has this Funding Source been agreed with the Chamberlain's Department?	N/A
Report of:	For Decision
Damian Nussbaum, Executive Director, Inclusive Growth	
Emma Moore, Chief Operating Officer	
Report author:	
Joe Dromey, Director, Central London Forward	
Monica Patel, Commercial Lead, Commercial Service	

Summary

This report seeks approval for the increase in value of the Work and Health Programme – Central London Works by £6m, or 7.1% of current contract value.

Central London Works is an employment programme, managed by Central London Forward (CLF). The increase in contract value would be funded by an additional £2.9m offered by Department for Work and Pensions (DWP), and £3.1m of UK Shared Prosperity Fund. The contract end date is unaffected.

The increase in contract value is fully funded. Approval is required given the contract value exceeds $\pounds 2m$ as per Section 16.3 of the Procurement Code Part One. The increase is permissible under Reg 72(1)(b) of the Public Contracts Regulations 2015.

Recommendation(s)

Members are asked to:

• Approve an increase in contract value of £6m, to give a total value of £89.6m.

Main Report

Background

 Central London Works is an employment programme which supports disabled residents in central London into work. Central London Works is managed by Central London Forward (CLF) – the partnership of the 12 central London local authorities. CLF is hosted by the City of London Corporation.

Current position

- 2. The contract was awarded following competitive tender in 2018. The initial contract value was £53.4m over 5 years, with an option to extend for 2 years. The programme was funded by Department for Work and Pensions (DWP) and European Social Fund (ESF).
- 3. In 2020 the contract was varied to deliver the Job Entry: Targeted Support (JETS) programme. JETS provided rapid support to residents who lost their jobs during the pandemic. The value of JETS was £18.0m.
- 4. On 8th December 2022, Court of Common Council approved the extension of Central London Works for 23 months, enacting the extension clause in the original contract. The programme will take new starters until October 2024.

Proposed extension

- 5. CLF would like to increase the contract value for Central London Works in order to support more residents into work. There are two elements of the extension:
- Place and Train On 9th June 2023, DWP offered £2.9m of funding to deliver 'place and train' support through Central London Works. Participants would be supported rapidly into work, and provided with ongoing support to sustain in employment. This additional funding would enable us to help a further 1,353 economically inactive residents. DWP expect the support to be delivered from September 2023.
- 7. UK Shared Prosperity Fund (UKSPF) UKSPF has been designed to replace ESF post-Brexit. CLF has been allocated £8.3m of UKSPF by the Greater London Authority, which is the managing authority for UKSPF in London. CLF would like to use £3.1m of our UKSPF funding to support an additional 1,462 residents through the Central London Works programme.
- 8. The end date of the programme would be unaffected, and the support offer remains substantively the same.
- 9. The increase is permissible under Reg 72(1)(b) of the Public Contracts Regulations 2015, as a change of contractor would 'cause significant inconvenience or substantial duplication of costs for the contracting authority', and because the increase in value does not exceed 50% of the original contract.

Value

10. The proposed increase in contract value is £6m, representing 7.1% of the current contract value. The total contract value after this increase is £89.6m.

Options

11. There are three options:

- a. **Increase contract value** this would enable Central London Works to provide employment support to an additional 2,815 residents. It is permissible under Reg 72(1)(b), and would offer best value for money.
- b. **Go out to tender** this would not be viable. As delivery is expected to start from September 2023, there is not sufficient time to tender or allow a new supplier to mobilise. The option would not offer best value.
- c. **Do nothing** this option would mean we are not able to provide additional support, and it would pose reputational risk.

Recommendation

- 12. The recommendation is to increase the contract value by £6m to £89.6m.
- 13. The advantages of this approach would be:
 - a. to provide employment support to an additional 2,815 central London residents, helping at least 985 into employment;
 - b. to ensure continuity of service through Central London Works;
 - c. the option is compliant with Reg 72(1)(b) of Public Contracts Regulations 2015

Corporate & Strategic Implications

- 14. **Strategic implications -** The increase would contribute toward outcomes 2, 3 and 8 of the City Corporation's Corporate Plan, and priority 1 of the Central London Forward Strategy.
- 15. Financial implications None. The increase is fully funded.
- 16. Resource implications None.
- 17. Legal implications None. Advice from Comptrollers is that the increase in contract value is permissible under Reg 72(1)(b) of the Public Contracts Regulations 2015.
- 18. **Risk implications –** There are no risk implications of increasing the value of the contract. There are reputational and delivery risks of not increasing contract value.
- 19. Equalities implications The increase in contract value would have a positive impact through helping tackle employment inequalities. Central London Works has an equalities policy, which seeks to ensure a high-quality service to all participants.
- 20. **Climate implications** Central London Works has a sustainability policy, which seeks to minimise emissions and environmental impact as party of service delivery.

21. Security implications – None.

Conclusion

22. This report recommends an increase in the value of the Work and Health Programme – Central London Works contract by £6m to £89.6m, as permitted by Reg 72(1)(b) of the Public Contracts Regulations 2015.

Appendices

None

Background Papers

None

Joe Dromey

Director, Central London Forward T: 07710 114 658 E: joe.dromey@cityoflondon.gov.uk

Agenda Item 9

O	Datal
Committee(s):	Dated:
Operational Property and Projects Sub Committee	3 July 2023
	0 001y 2020
Bridge House Estates Board	5 July 2023
Subject:	
	Public
Technical Adjustments to the Procurement Code for	
Bridge House Estates Procurements	
Which outcomes in the City Corporation's Corporate	4, 5, 6,11
Plan does this proposal aim to impact directly?	
Does this proposal require extra revenue and/or	Ν
capital spending?	
If so, how much?	N/A
What is the source of Funding?	N/A
Has this Funding Source been agreed with the	N/A
Chamberlain's Department?	
Report of: Emma Moore, Chief Operating Officer	
Report author:	For Decision
Genine Whitehorne, Commercial Director	

Summary

The Procurement Code is the policy which underpins all procurement and purchasing activity across the City Corporation including our institutional departments. Procurement policies are reviewed annually to ensure they are up to date and still operationally viable. Following a consultation process, the most recent set of revisions to the Procurement Code were approved by Operational Property and Projects Sub-Committee, Finance Committee and Court of Common Council in September, November, and December 2022 respectively. These revisions support the efficiency principles under the Target Operating Model (TOM) specifically to align activity and resources to our corporate outcomes; increase the pace of decision making; and achieve cost savings to resolve budget deficit.

In accordance with Standing Order 51, approval is being sought to make technical adjustments to the Procurement Code in order to provide further clarification to approval processes for Bridge House Estates (BHE) procurements relating to contract lettings, waivers, extensions where contracts terms allow for extensions, and increases in contract value. This is not a request for a policy change and significant changes to the Procurement Code require the approval of the Court of Common Council.

Recommendations

Members are asked to:

• Approve technical adjustments for Bridge House Estate procurements contained in rules 16.2, 25.1, 30.2 and 30.4 of the Procurement Code, relating

to the approval processes for contract lettings, waivers, extensions where contracts terms allow for extensions and increases in contract value, to be effective from 3 July 2023.

Main Report

Background

- 1. The Procurement Code is the policy which underpins all procurement and purchasing activity across the City Corporation and the institutional departments. Part 1 of the Procurement Code is the framework of overarching rules to be followed by any officer when purchasing goods, services or works and has been developed in line with UK Public Contracts Regulations 2015. Part 2 of the Procurement Code is the guidance document which provides context, processes and further information relevant to compliance with the rules outlined in Part 1.
- 2. Procurement policies are reviewed regularly to ensure they are up-to-date and still operationally viable.
- 3. The most recent set of revisions to the Procurement Code were approved by Operational Property and Projects Sub Committee, Finance Committee and Court of Common Council in September, November and December 2022 respectively.
- 4. Following a further consultation process in May 2023, the proposed technical adjustments for BHE procurements support the efficiency principles under the TOM, specifically to align activity and resources to our corporate outcomes; increase the pace of decision making; and achieve cost savings to resolve budget deficit.
- 5. The Bridge House Estate Board will formally consider the proposals at its meeting of 5 July 2023.

Current Position

- 6. Standing Order 51 provides that the Operational Property and Projects Sub Committee is responsible for authorising any technical adjustments to the Procurement Code and only significant changes need approval by Court of Common Council.
- 7. This is not a request for approval for a policy change. Rather, approval is sought from Members of the Operational Property and Projects Sub-Committee on behalf of Finance Committee to make technical adjustments to rules 16.2, 25.1, 30.2 and 30.4 of the Procurement Code which are summarised in the table below.
- The proposed technical adjustments to the Procurement Code can be seen in the tracked changes in Appendix 1: Draft Revised Procurement Code Part 1 – July 2023.

Rule	Change	Rationale
16. 2 – Contracts Letting Approval Process	Contract letting approval Process table amended to allow BHE Board to approve BHE contracts in place of Operational Property and Projects Sub-Committee and Finance Committee.	With the constitution of the BHE Board (as approved by the Court in March 2021), that Board should discharge all functions of the City of London Corporation as the charity Trustee, except where they have been expressly reserved to the Court of Common Council.
		Arising from a recent BHE procurement exercise it was noted that updates were required to explicitly give effect to the governance arrangements agreed in respect of BHE, with the Finance Committee on 18 April 2023 endorsing this review in order to enable matters of BHE procurement to be approved directly by the BHE Board.
25.1 - Waivers	Waiver approval process table amended to clarify that Bridge House Estates Board (BHE) should approve non-compliant BHE waivers over £100,000 in place of Operational Property and Projects Sub-Committee.	As above.
Rule 30.2 - Contract Extensions (non- projects where contract terms allow for extension): Approval Process	The approval process for contract extensions where contract terms allow has been amended to allow BHE Board to approve such BHE contract extensions in place of the Operational Property and Projects Sub-Committee and Finance Commitee.	As above.

Table 1 Summary of changes

Rule	Change	Rationale
30.4 - Increases in contract value	The approval process for increases in contract value has been amended to allow BHE Board to approve increases in BHE contract values in place of Operational Property and Projects Sub-Committee and Finance Committee.	As above.

9. Corporate & Strategic Implications

Strategic implications

The technical adjustments to the Procurement Code relating to BHE procurements are aligned with the objectives of the Corporate Plan and the Departmental Business Plan.

Financial implications

There are no initial financial implications as the changes are simply to allow the Bridge House Board to apply the Procurement Code instead of Operational Property and Projects Sub-Committee and Finance Committee.

Resource implications

The changes in this document will allow the Commercial Service to focus on providing efficiency in purchasing as per the recommendations of the Target Operating Model.

Pending amendments to the relevant committee approval routes, the Procurement Code will otherwise be observed in matters of BHE Procurement in accordance with its current provisions and BHE officers will work in conjunction with the Commercial Service to progress these matters in the usual way.

Legal implications

None.

Risk implicationsThe technical adjustments pose a minimal risk as Member oversight is being retained in the Procurement Code.

Equalities implications None.

Climate implications None.

Security implications None.

Conclusion

10. The Commercial Service recommend the approval of four technical adjustments to the Procurement Code as outlined in this report and shown in Appendix 1, to be effective from **3 July 2023**.

Appendices

Appendix 1 – Draft Revised Procurement Code Part 1 – July 2023.

Genine Whitehorne

Commercial Director, The Commercial Service E: <u>genine.whitehorne@cityoflondon.gov.uk</u>] This page is intentionally left blank



CITY OF LONDON PROCUREMENT CODE PART ONE: RULES

January 2023

Con A.	tents INTRODUCTION	1		
В.	GOVERNANCE AND PRINCIPLES	2		
1.	External Regulations	2		
2.	Public Contracts Regulations 2015	2		
3.	Governance	2		
4.	Monitoring	2		
5.	Best Value	3		
6.	Codes of Conduct	3		
7.	Conflicts of Interest	3		
8.	Transparency	3		
9.	Collaboration	4		
10.	Equal Treatment	4		
11.	Proportionality	4		
C.	OPERATIONS	4		
12.	Annual Sourcing Plan	4		
13.	Section 20 Consultations and the use of Nominated Suppliers	4		
14.	Estimating Contract Values	4		
15.	Procurement Thresholds and Procedures	5		
16.	Contract Letting Thresholds			
17.	Corporate Contracts	7		
18.	Concession Contracts	7		
19.	Creating a City of London Framework	7		
20.	Using Frameworks created by External Contracting Authorities	7		
21.	Access Agreements	7		
22.	Police Collaborative Agreements	7		
23.	Appointment of External Procurement and Legal Consultants	8		
24.	Communication with Suppliers	8		
25.	Waivers	8		
26.	Competitive Procurement Exemptions	9		
D.	CONTRACT MANAGEMENT	9		
27.	Contract Management	9		
28.	Contracts Register	9		
29.	Document Retention	10		
30.	. Contract Extensions (Non-projects where contract terms allow for extension)			

1

31.	1. Contract Variations					
31.1	31.1. Variations to Specification1					
31.2	2. Increases in Contract Value	11				
31.3	3. Alterations to contract terms and conditions	12				
31.4	Contract Termination	12				
32.	Contracts procured by third parties, assigned or novated to the Corporation	12				
33.	Changes in identity of Suppliers	12				
34.	Contract Signatures	13				
35.	Financial Standing and Risk Management	13				
36.	Contract Terms and Conditions	13				
37.	Standard Procurement Documents	13				
38.	Disposal of goods	13				
39.	Complaints about Police Contractors	14				
40.	References and the Promotion and Marketing of Suppliers	14				
E.	TRANSACTIONAL FINANCE	14				
41.	No PO No Pay Policy	14				
42.	Amendments to Purchase Orders	14				
43.	Prompt Payment	14				
44.	Purchase Cards	14				
45.	5. Supplier Creation (Oracle System) 1					
F.	RESPONSIBLE PROCUREMENT	15				
46.	Responsible Procurement Policy	15				
47.	Climate Action	15				
48.	Supplier Diversity and Local Procurement	15				
49.	Equity and Diversity	16				
50.	Living Wage Policy	16				
51.	Modern Slavery and Human Rights	16				
52.	Air Pollution	16				
53.	Road Danger Reduction	17				
54.	54. Health & Safety17					
55.	Biodiversity	17				

A. INTRODUCTION

The Procurement Code ("the Code") is a fundamental component that governs procurement and assists the implementation and delivery of the City of London Corporation's (the Corporation) strategic goals. Procuring (buying) goods, works and services in the right way is essential to ensure value for money is achieved. The Procurement Strategy and service performance is ultimately overseen and authorised by elected members.

The Code constitutes the rules that must be followed when any procurement is undertaken by the Corporation and are designed to ensure that risks are minimised, procurement complies with relevant legislation such as Public Contracts Regulations and our spend is leveraged to support national and City Corporation policy outcomes.

Guidance and templates to underpin each of the rules and assist officers with undertaking procurement can be found in Part Two of this Code.

The Code also applies to the Corporation for all procurement activities regardless of funding stream. The Code applies to procurements funded by City Fund, City's Cash, Bridge House Estates and externally funded or collaborative projects where the Corporation is the contracting authority conducting the procurement and signing the contract.

Officers must seek Line Manager approval to undertake a procurement exercise regardless of contract value.

The Corporation's procedures and guidelines contained in the <u>Financial Regulations</u>, Standing Orders, <u>Project Procedures</u>, Scheme of Delegation and <u>Responsible Business Strategy</u> should also be taken into account when undertaking a procurement.

B. GOVERNANCE AND PRINCIPLES

1. External Regulations

- **1.1.** Public Procurement is subject to a regulatory framework which directly impacts the Corporation in its capacity as a local and police authority. These include Public Contracts Regulations 2015, Concessions Contract Regulations, the Social Value Act, Small Business Enterprise and Employment Act 2015, Local Government Act 1999 and other UK legislation.
- **1.2.** All processes above and below the Find a Tender Service (FTS) threshold contracts are regulated where they are undertaken in the Corporation's capacity as a local and police authority.

2. Public Contracts Regulations 2015

- 2.1. Public Contracts Regulations 2015 (PCR 2015) apply as a matter of law to the Corporation when it acts in its capacity as local authority (including as port health authority) or police authority (i.e. City Fund activities). The Corporation's procurement policy reflected in this Procurement Code is that, unless Comptroller & City Solicitor's department (C&CS) has advised in writing to the contrary or Members have resolved otherwise, the PCR 2015 will be applied to ALL the Corporation's procurement activities without distinguishing between the Corporation's various capacities or functions. Therefore, PCR 2015 will also be applied when the Corporation acts in its general corporate capacity, whether in respect of City's Cash funded functions or as a corporate trustee (e.g. in respect of Bridge House Estates or any other charity); or otherwise acts (in whatever capacity) as an accountable/contracting body for collaborative or jointly-funded projects where the Corporation undertakes the procurement and enters into the contract.
- **2.2.** PCR 2015 applies to all public supplies, services and works contracts. Failure to comply with PCR 2015 could expose the Corporation to the risk of a successful legal challenge. Therefore, all procurements subject to PCR 2015 must be undertaken by the Commercial Service.

3. Governance

- **3.1.** The Chief Operating Officer is responsible for the Commercial Service, which is the central service for the Corporation's procurement operations.
- **3.2.** The Finance Committee are responsible for overseeing the performance and development of the Commercial Service. However, major decisions regarding policy and financial approval will be referred to Policy and Resources, Court of Common Council or other Committees for approval wherever necessary.
- **3.3.** Category Boards are decision making forums that are responsible for approving and overseeing procurement strategy and performance monitoring in major areas of related expenditure, such as construction or information technology. This includes approval of non-project related procurements and prioritisation of procurements within spend categories. Category Boards report into Operational Property and Projects Sub Committee.

4. Monitoring

4.1. The Commercial Service is responsible for monitoring and reporting on all of the Corporation's procurement expenditure and activities. Procurement is subject to scrutiny by the Corporation's Internal Audit Service and the Policy and Compliance team which may undertake audits, issue reports, and make recommendations on any of its activities.

The Corporation's procurement activities and processes are also subject to external audit

reviews and the Crown Commercial Service <u>Public Procurement Review Service</u>. The PublicProcurement Review Service allows suppliers to raise concerns anonymously about potentially poor public sector procurement practice. Their role is to investigate suitable cases referred to them and to highlight improvements that could be made to procurement practices and potential conflicts with best practice or PCR 2015.

5. Best Value

- **5.1.** Officers undertaking procurement on behalf of the Corporation have a duty to apply Best Value principles in accordance with section 3 of the Local Government Act 1999. The Best Value principles are relevant to the entire procurement process and this Code and must always be taken into account.
- **5.2.** The duty to achieve best value for the Corporation requires us to consider and investigate economic, environmental and social aspects and outputs in relation to the purchasing decisions we make. Through our procurement processes and activities, we aim to minimise the negative impacts associated with goods, services and works and their associated supply chains and maximise potential benefits including social value. This commitment is regulated in public services contracts by the Public Services (Social Value) Act 2012 and the Responsible Procurement Policy.
- **5.3.** Section 3 of the Local Government Act 1999 and the Public Services (Social Value) Act 2012 applies to the Corporation without distinguishing between its various functions. When acting in a capacity other than as a local or police authority, Section 3 of the Local Government Act 1999 and the Public Services (Social Value) Act 2012 will be considered as applicable, unless C&CS has advised in writing to the contrary.
- **5.4.** The Corporation intends to award contracts based on quotes or tenders which represent the most advantageous tender to the Corporation in terms of price, quality & Responsible Procurement for the provision of goods, services and works.

6. Codes of Conduct

- 6.1. The Corporation expects all persons involved in procurement to behave with the highest levels of probity and integrity in accordance with the Bribery Act 2010, this Code, the Employee Code of Conduct and the Fraud Awareness Policy. Failure to adhere to these conditions may result in disciplinary action and, in the most serious cases, criminal investigation and prosecution.
- **6.2.** All external persons involved in a procurement process will need to complete a non-disclosure agreement and maintain confidentiality throughout the procurement process including any standstill periods.

7. Conflicts of Interest

7.1 All persons involved in a procurement exercise must declare immediately any personal or business interest arising from the procurement exercise in accordance with the process contained in Part Two of the Code.

8. Transparency

8.1. The Commercial Service is responsible for publishing procurement information required by the Local Government Transparency Code 2015 and for managing Freedom of Information Requests relating to procurement. The requirements do not extend to the Corporation's non-local authority functions including the Police and Crime Commissioners for whom a separate transparency framework applies.

9. Collaboration

9.1. Procurement will be undertaken in a spirit of collaboration between the Commercial Service, officers and Members of the Corporation as a whole, our external partners and suppliers and the communities it serves. In many cases this will involve working jointly for the corporate good across the organisation and in collaboration with external partners.

10. Equal Treatment

10.1. All procurement undertaken by the Corporation must accord equal treatment and consideration to all organisations competing for its contracts. This involves undertaking the procurement in accordance with the rules, procedures and guidance we publish and applying them equally to all participants without favour.

11. Proportionality

11.1 The processes to be followed by the Corporation should be proportionate to the value, strategic and operational importance, statutory obligations, contractual and related risks (including reputational and uninsurable risks), and commercial benefits of the procurement being undertaken.

C. OPERATIONS

12. Annual Sourcing Plan

- **12.1.** Chief Officers must provide the Commercial Director for the Commercial Service with an annual forecast in November, for the next financial year, of all procurements valued at £100,000 or more for supplies or services and £400,000 or more for works, to enable the Commercial Service to plan and allocate resources for the following financial year to be included in the Annual Sourcing Plan for approval by relevant Category Board.
- **12.2.** The Category Boards will review the Sourcing Plan on a quarterly basis. Any projects that arise that have not been included in the Sourcing Plan will be considered by the Category Boards and priority will be given to projects which will deliver savings and efficiencies and meet the objectives of the Corporate Plan.

13. Section 20 Consultations and the use of Nominated Suppliers

- **13.1.** Procurements relating to supplies, services and works for residential properties leased by the Corporation may be subject to statutory requirements for the Corporation to consult with leaseholders under Section 20 of the Landlord and Tenant Act 1985 (as amended).
- **13.2.** Officers responsible for managing the properties for which the procurements are being undertaken are also responsible for undertaking the consultation with leaseholders and will need to factor in the longer lead-in times for procurement processes in cases of leaseholder consultation.
- **13.3.** Below the FTS threshold, procurements relating to supplies, services and works for residential properties leased by the Corporation may also be subject to Section 20 which allows leaseholders to nominate suppliers to be considered for inclusion in tenders.
- **13.4.** During Section 20 Consultations, tenders will be made available for inspection to leaseholders.

14. Estimating Contract Values

14.1. Officers estimating contract values for the purposes of complying with the procurement thresholds should calculate the whole estimated contract value over the life of a contract,

including provision for subsequent phases of a project, appropriate contract extensions and options.

- **14.2.** Officers must not deliberately sub-divide or disaggregate procurements for the purpose of avoiding the thresholds in this Code.
- **14.3.** The Commercial Service must be consulted regarding all procurement estimates above £100,000. Officers may consult the Commercial Service on contracts under £100,000.
- **14.4.** Officers must include VAT where it applies, for the purposes of estimating whether a contract meets FTS thresholds for goods, services and works.

15. Procurement Thresholds and Procedures

- **15.1.** The quotation and tender thresholds apply to all procurement including the procurement phases of capital projects. All financial thresholds in the Procurement Code are exclusive of VAT or any other taxes.
- **15.2.** All contracts valued at £100,000 or more for supplies or services, and £400,000 or more for works, must be advertised except where an existing approved Corporate Contract or framework is being used.
- **15.3.** The following thresholds apply:

Type of Procurement	Goods & Services	Works	Guidance
Operational Purchasing	Up to £100,000	Up to £100,000	Officers may seek quotations directly from suppliers in accordance with the process outlined in Part 2.
			Once a quotation has been obtained, a requisition must be created on iProcurement and submitted to the Commercial Service who will issue a Purchase Order to the selected supplier. Where a Corporate Contract exists, it must be used.
One-off Purchasing		More than £100,000 but less than £400,000	Request for Quotation must be undertaken by the Commercial Service through the eTendering portal. A minimum of three firms to be invited to submit written quotations one of which should be a local firm, SME, or a Social Enterprise.

Table 1 Procurement Thresholds

Strategic PurchasingMore than £100,000£400,000 or more	Options Appraisal must be undertaken by the Commercial Service. Any resulting procurement must go through the tendering portal.
---	--

- **15.4.** All procurements above the FTS threshold for goods and services and works must be advertised in accordance with Public Contracts Regulations 2015. The use of the Negotiated Procedure without Prior Publication may only be recommended in very specific circumstances contained in Part Two of the Code and with the approval of the Commercial Director for the Commercial Service.
- **15.5.** For supplies, services and works below the FTS threshold which are subject to Section 20 of the Landlord and Tenants Act 1985, please refer to 'Section 20 Consultations and the Use of Nominated Suppliers' Rule in this Code and associated guidance in Part Two of this Code.

16. Contract Letting Thresholds

- **16.1.** The approval thresholds below set out the levels of approvals required by officers to proceed with the various phases of non-project related procurements and the award of contracts.
- **16.2.** The following thresholds apply to the total contract value:

Total Contract Value	Approval Process
£100,000 and below	Options – Chief Officer Contract Award - Relevant Chief Officer/or an Officer with Delegated Authority from the Chief Officer.
>£100,000 - less than £2,000,000	Options - Relevant Category Board Contract Award - Relevant Category Board
£2,000,000 or More - less than £4,000,000	Options (Stage 1): Report for Relevant Category Board and Operational Property and Projects Sub) Committee, or Bridge House Estates Board for Bridge House Estates Procurement, for approval to proceed with a procurement and for the procurement strategy. Contract Award (Stage 2): Report for Relevant Category Board and Operational Property and Projects Sub Committee, or Bridge House Estates Board for Bridge House Estates Procurement, which receives final recommendation on contract award.
£4,000,000 and above	 Options (Stage 1): Report for Relevant Category Board, Operational Property and Projects Sub Committee and Finance Committee, or Bridge House Estates Board for Bridge House Estates Procurement, for approval to proceed with a procurement and for the procurement strategy. Contract Award (Stage 2): Report for Relevant Category Board, Operational Property and Projects Sub Committee and Finance Committee, or Bridge House Estates Board for Bridge House Estates Procurement, and Court of Common Council which receives final recommendation on contract award.

 Table 2 Contract Lettings Thresholds

Different approval processes and thresholds apply to the procurement phases of projects. The project approval thresholds can be found on the <u>Project Team's SharePoint pages</u>.

17. Corporate Contracts

- **17.1.** The Commercial Service maintains a range of <u>Corporate Contracts</u> for supplies, services and works that are commonly required by all or a wide range of the Corporation's departments. Officers must use Corporate Contracts to ensure value for money, efficiency and best practice.
- **17.2.** Information relating to Corporate Contracts may be commercially sensitive and officers must not communicate it directly or indirectly to other external suppliers.

18. Concession Contracts

18.1. Concession contracts must be undertaken in consultation with the Commercial Service, City Surveyor's, and Comptroller & City Solicitor's in accordance with the procedures set out in Part Two of this Code.

19. Creating a City of London Framework

- **19.1.** The procurement of frameworks are subject to the Procurement Thresholds Rule and the award decision is subject to the Contract Letting Thresholds Rule. Mini competitions or call-offs from such frameworks should be administered through the Commercial Service.
- **19.2.** All tenders for the creation of Corporation frameworks must be undertaken by officers in the Commercial Service.

20. Using Frameworks created by External Contracting Authorities

- **20.1.** Before using an external framework for the first time, the Commercial Service will undertake a due diligence assessment of the benefits and risks, adopting a proportionate approach in accordance the guidance set out in Part Two of this Code.
- **20.2.** The award of contracts arising from the use of external frameworks is subject to the Contract Letting Thresholds and Project Approval process where applicable.
- **20.3.** Where applicable, relevant Responsible Procurement commitments and weighting should be included as part of a mini-competition and or award process.

21. Access Agreements

21.1. Where use of a framework is conditional upon the Corporation first signing an Access Agreement (or similar) with the external contracting authority, such an agreement must be reviewed by the Commercial Service in accordance with the procedures Part Two of this Code and signed by the Commercial Director or delegated officer.

22. Police Collaborative Agreements

- **22.1.** Comptroller & City Solicitor's, the Commercial Service and the Chamberlain's Risk Management and Insurance Team must be consulted in relation to any police collaboration agreements. The terms and conditions for any proposed collaboration agreements must be vetted by the Comptroller & City Solicitor's department in accordance with provisions of Rule 36 'Contract Terms and Conditions'.
- **22.2.** Approval for any collaboration will require approval from the Police Authority Board and the Commissioner of the City of London Police. Any agreement must be signed by the Commissioner and the Comptroller and City Solicitor or an Assistant City Solicitor on behalf of the Corporation in it's capacity as Police Authority.

23. Appointment of External Procurement, Property and Legal Consultants

- **23.1.** Officers wishing to appoint external consultants to assist with procurement projects must consult the Commercial Service before all such appointments are made.
- **23.2.** Officers planning to appoint external property and construction advisors must consult with the City Surveyor before all such appointments can be made.
- **23.3.** The appointment of external legal counsel including solicitors and barristers is also subject to Comptroller & City Solicitor's department consultation and procedures.
- **23.4.** Any resulting appointment must comply either with this Code in respect of a procurement in line with services thresholds or via the Human Resources Recruitment and Selection policy in respect of short-term contracts of employment or the appointment of temporary staff. All external consultants and companies appointed by the Corporation to assist with procurements must be advised of their obligation to comply with this Code's rules on Codes of Conduct and Conflicts of Interest.

24. Communication with Suppliers

24.1. The Commercial Service is responsible for managing all communications with suppliers during procurement projects via the Corporation's e-tendering portal. Officers should follow the advice and instructions of the Commercial Service. Failure to do so may compromise confidentiality and data protection obligations; give rise to a conflict of interest; and jeopardise the procurement.

25. Waivers

25.1. In special or exceptional circumstances identified in Part Two of the Code, the requirements of this Code may be waived provided one of the following authorisations has been received:

	Approval Required by
£100,000 or less	No Waiver report is necessary. To be considered as part of the Procurement Authorisation Report. Please see Part 2 for more details.
More than £100,000 Compliant	Waiver to be considered as part of an options report in accordance with the Contract Letting Thresholds Rule
More than £100,000 Non- Compliant	Relevant Spend Committee for the department requesting the Waiver (and Operational Property and Projects Sub Committee for contracts let as part of projects), or Bridge House Estates Board for Bridge House Estates Waivers.

Table 3 Waiver Approval Thresholds

- **25.2.** Waivers that cannot wait for the next committee date can be approved via the urgent committee report process which is the Town Clerk in consultation with the Spend Committee Chairman and Deputy Chairman. All urgent waivers must come through the Commercial Service before going to committee clerks.
- **25.3.** The award of a contract arising from a non-compliant waiver must be issued by the Commercial Service through the eTendering portal.

- **25.4.** All non-compliant waivers granted will be reported quarterly to Finance Committee and annually to the relevant spend committees for information.
- **25.5.** The requirement to obtain waivers for not using Corporate Contracts applies to all procurement values including purchases below £100,000.
- **25.6.** Procurements over the FTS thresholds cannot legally be waived when the Corporation is acting in its capacity as a local authority or police authority. When acting in a capacity other than as a local authority, waivers for procurements over the FTS thresholds will not be considered unless the Comptroller & City Solicitor has provided written advice in accordance with rule 2.1.
- **25.7.** Where applicable, relevant Responsible Procurement commitments should be considered and included in contracts awarded as part of the waiver process.

26. Competitive Procurement Exemptions

- **26.1.** There are limited instances where it is not necessary to seek a competitive tender or quotations. The approved list of exemptions to procurement is included in <u>Competitive</u> <u>Procurement Exemptions Policy</u>.
- **26.2.** The award of a contract arising as a result of Competitive Procurement Exemption may be subject to the approvals as per Contract Letting Thresholds rule. Please consult the Competitive Procurement Exemptions Policy for more information. Contracts issued as a result of an exemption should be included on the Commercial Service's Contract Register.
- **26.3.** Where possible, relevant Responsible Procurement commitments should be considered and included as part of the contract award process as a result of an exemption.

D. CONTRACT MANAGEMENT

27. Contract Management

- **27.1.** Contracts awarded following procurements undertaken by the Commercial Service will be managed by appropriate officers in each department directly for their own department, on behalf of a group of departments or, in the case of Corporate Contracts, the Corporation as a whole including any external organisations using the contract.
- **27.2.** The Corporation's key suppliers known as Category A contracts are subject to regular assessments against the City's Corporate Supplier Performance Scorecard. The Commercial Service's Commercial Leads must be engaged to assist with completion of the scorecard and contract management for Category A suppliers. Further information about contract categories is contained in Part Two of the code.

28. Contracts Register

- **28.1.** The Commercial Service is responsible for managing and maintaining an electronic register of all contracts awarded including those contracts awarded via a waiver or a framework by the Corporation or assigned to the Corporation by third parties.
- **28.2.** After a contract has been awarded, the officers and department responsible for managing the contract must notify the Commercial Service of any changes to the status of the contract including but not limited to contract extensions, contract value, scope, terminations and changes to contract management arrangements. Please note the rules relating to Contract Extensions, Contract Variations, Changes in Identity of Suppliers and

Contract Terms and Conditions.

29. Document Retention

- **29.1.** The Corporation's regulations for the retention of tenders, quotations and contracts are set out in Part Two of the Corporation's Financial Regulations.
- **29.2.** The Commercial Service is responsible for maintaining a register of tenders and quotations and will keep records for six years.
- **29.3.** Contracts awarded under seal for supplies and services at £250,000 or above and for works at £400,000 or above must be kept for 12 years from the date of final delivery or completion of the supply, services or works to which they relate. Contracts not under seal must be kept for six years from the date of final delivery or completion of the supply, services or works to which they relate.
- **29.4.** Where the Comptroller & City Solicitor's have not prepared contracts for execution or signature, the Commercial Service must provide to the C&CS Business Systems & Information Manager original or digitally signed copies of every contract it awards within 14 days of the contract being exchanged and signed by the parties. The 14 days will also apply to all contract variations, extensions and change requests which are prepared at a local level. The C&CS has its own internal procedures for those contracts and other documents it prepares. C&CS is responsible for the storage and archiving of the original contracts.

30. Contract Extensions (Non-projects where contract terms allow for extension)

- **30.1.** Officers have the right to extend non-project related contracts if the contract terms allow for an extension and the requisite approval was obtained in accordance with the Contract Letting Thresholds (see rule 16 above). However, before exercising the right to extend, officers must also undertake a formal contract review for all contracts at a total value of £100,000 or more in conjunction with the Commercial Service to evaluate contract performance, value for money, delivery of responsible procurement commitments and alternative procurement opportunities.
- **30.2.** The following thresholds and procedures apply to the review:

Total Contract Value	Contract Review Procedure	Approval Procedure
£100,000 - less than £2,000,000	Departmental Contract Manager and the Commercial Service Officer undertake joint review and produce a report with appropriate recommendations. The review should take place 6 months before the expiry of the minimum term.	Relevant Category Board or Commercial Service Team as delegated.

Table 4 Contract Extensions Approval Thresholds

£2,000,000 - less than £4,000,000	Departmental Contract Manager and the Commercial Service Officer undertake joint review and produce a report with appropriate recommendations. The review should take place 9 months before the expiry of the minimum term.	Category Board and Operational Property and Projects Sub Committee or Bridge House Estates Board for Bridge House Estates Procurement.
£4,000,000 or more	Departmental Contract Manager and the Commercial Service Officer undertake joint review and produce a report with appropriate recommendations. The review should take place 9 months before the expiry of the minimum term.	Category Board, Operational Property and Projects Sub- Committee, Finance Committee or Bridge House Estates Board for Bridge House Estates Procurement and Court of Common Council (unless Court of Common Council have approved the original contract award in accordance with the Contract Lettings approval process with a recommendation to authorise Operational Property and Projects Sub-Committee or Bridge House Estates Board for Bridge House Estates procurements to approve the use of contract extension provisions).

30.3. Variations to Specification

Variations to specifications shall not take place after a contract award unless:

- There is scope within the contract (specification, terms and conditions or other schedule) to enable it to be modified
- the changes are compliant with Regulation 72 of PCR 2015; and or
- changes in law arise which place new statutory duties upon the Corporation of obligations upon the contractor which must be provided for within any specification; and or
- changes in policy arise which must be provided for within the specification.

Where a variation does not give rise to a change in contract value, the Commercial Service must be consulted who may undertake further consultation with C&CS before any variation to contract may be issued.

Where the variation gives rise to a change in contract value, the approval process contained in Increases in Contract Value rule will apply.

30.4. Increases in Contract Value

Contract expenditure that will exceed the approved provision (not including existing extensions) after allowing for inflation by more than 20% or £400,000, whichever is the lowest, must be reviewed by the Commercial Service. Contracts awarded below FTS thresholds cannot legally be increased over the relevant thresholds.

For contracts originally awarded over FTS any increases in price cannot exceed 50% of the original contract value.

In addition to the Commercial Contract Management team review the following authorisation is required:

Table 5 Increases in Contract Value Approval Thresholds

New Total Contract Value*	Approval
£100,000 but less than £2,000,000	Relevant Category Board
£2,000,000 but less than £4,000,000	Operational Property and Projects Sub Committee, or Bridge House Estates Board for Bridge House Estates Procurement, and any Committee(s) which considered the Contract Letting Report
£4,000,000 or more	Operational Property and Projects Sub Committee, or Bridge House Estates Board for Bridge House Estates Procurement, any Committee(s) which considered the Contract Letting Report and Court of Common Council

For contracts where known risks have been included on the project risk register and the additional budget has already been approved via the Project Gateway Approval Process, further approval must be sought via the Gateway Approval Process.

30.5. Alterations to contract terms and conditions

A substantive alteration of the terms and conditions or the suspension or abrogation (cancellation) of the proper performance of any contract, or part or parts thereof, to which the Corporation is a party, shall be subject the same approval as laid out in Contract Letting Thresholds Rule.

30.6. Contract Termination

The Commercial Service and C&CS must be consulted regarding termination of contracts over £100,000. Please see part two of the Code for more information.

31. Contracts procured by third parties, assigned or novated to the Corporation

- **31.1.** This Code does not apply to contracts which have been procured by a third party and assigned or novated to the Corporation following the acquisition by, or reversion to, the Corporation of long leasehold interests or the acquisition of freehold interests.
- **31.2.** These contracts will be handled directly by the City Surveyor who shall ensure in consultation with C&CS that the required due diligence on the contracts is undertaken on any contracts which are to be assigned or novated to the Corporation following the completion of the commercial transaction.
- **31.3.** The City Surveyor should advise the Commercial Service of such contracts to ensure they are included in the Contracts Register.
- **31.4.** On the expiry of contracts procured by third parties which have been assigned or novated to the Corporation, where a Corporate Contract exists, the Corporate Contract must be used.

32. Changes in identity of Suppliers

- **32.1.** The Commercial Service must be consulted regarding the assignment or novation of contracts in accordance with the guidance and procedures in Part Two of this Code.
- **32.2.** No novation agreement must be entered into until:
 - (a) the terms have been agreed in consultation with Comptroller & City Solicitor's;
 - (b) the Chamberlain's department have been consulted on Financial Standing and Risk Management in accordance with rule 35;

(c) where applicable the new contractor meets the mandatory qualitative selection criteria and any Responsible Procurement commitments already in place with the extant supplier or contractor and there are no material modifications made to the original contract;

If the novation satisfies A-C, no further approval is required. Commercial Contract Management team and C&CS will draft the necessary novation agreement. If there is a significant change to the risk profile due to the change of the supplier, approval will need to be obtained in accordance with Contract Letting Thresholds Rule.

32.3. Where it is established that no assignment or novation has taken place but only a rebranding exercise following a company merger or acquisition, then a copy of the Change of Name Certificate must be provided to C&CS to place with the original contract.

33. Contract Signatures

- **33.1.** Chief Officers are authorised to sign contracts in accordance with Corporation's Scheme of Delegations having regard for approval requirements outlined in the Contract Letting Thresholds and any requirement for the contract to be executed as a deed. The signatory must ensure that there is an approved budget established before entering into a contract in accordance with the Corporation's Financial Regulations.
- **33.2.** C&CS is responsible for signing all contracts awarded of £250,000 or more for supplies or services and £400,000 or more for works. These contracts must be sealed by the Corporation and executed as a deed unless C&CS advise otherwise.

34. Financial Standing and Risk Management

34.1. The Commercial Service in conjunction with the Chamberlain's Financial Division are responsible for ensuring that appropriate steps have been undertaken to appraise the financial standing of the contractor and any other risks for contracts with an estimated value over the current FTS threshold for supplies or services and valued £400,000 or more for works. The process for this is outlined in Part 2 of the Procurement Code.

35. Contract Terms and Conditions

- **35.1.** C&CS maintain standard templates of conditions of contract. In the absence of a suitable template, or in cases that are complex or novel, C&CS will advise on appropriate terms. All proposals involving non-Corporation standard terms and conditions must be submitted to C&CS for vetting in good time to enable C&CS to amend terms or substitute as necessary.
- **35.2.** Where a contractor will be responsible for processing personal data on behalf of the Corporation, contract terms should meet the requirements of Article 28 of the General Data Protection Regulation (GDPR) as defined in Part 2 of the Procurement Code.

36. Standard Procurement Documents

36.1. The Commercial Service is responsible for developing and maintaining standard procurement documents to be used when conducting tenders or requests for quotations. Where a standard document exists, it must be used to ensure consistency and reduce the risk of a legal challenge.

37. Disposal of goods

37.1. The Commercial Service are responsible for ensuring that the Corporation has a range of

services to ensure that goods which have been purchased and are no longer required are disposed of in ways which support probity, value for money, health and safety and sustainability. Guidance on the Corporation's disposal of goods system is contained in Part Two of the Code.

- **37.2.** The disposal of any item of inventory shall comply with the Corporation's agreed disposals procedures.
- **37.3.** Goods with an estimated disposal value of in excess of £5,000 must be approved by the appropriate spend committee.

38. Complaints about Police Contractors

38.1. Contracts awarded by or for the City of London Police must take into consideration this Code, the <u>Independent Office for Police Conduct (IOPC) statutory guidance</u> and <u>The Independent Police Complaints Commission (Complaints and Misconduct) (Contractors) Regulations 2015.</u>

39. References and the Promotion and Marketing of Suppliers

- **39.1.** Officers must refer all requests for supplier references to the Commercial Service who will issue a response after consultation with the appropriate contract manager.
- **39.2.** Officers must also refer all requests for the promotion and marketing of suppliers to the Commercial Service who will decide whether the request should be approved.

E. TRANSACTIONAL FINANCE

40. No PO No Pay Policy

- **40.1.** A valid purchase order (PO) must be issued to the supplier, in conjunction with Rule 15 Procurement Thresholds, before any work commences.
- **40.2.** In a limited number of circumstances, exemptions may apply and are listed in the Purchase Order Exemption Policy. In these instances, an exemption code will act in place of a PO when invoices are received. Where appropriate, Officers should inform suppliers when an exemption to the No PO No Pay policy applies, so the exemption code can be included on the invoice.

41. Amendments to Purchase Orders

41.1. Requests to amend Purchase Orders must be submitted to the Procurement Operations team in accordance with the guidance set out in Part Two of this Code. Where no separate contract is in place, regard must be had to Extension of Contract and Contract Variation Rules.

42. Prompt Payment

42.1. The Corporation aims to pay undisputed invoices that quote a valid purchase order number (or approved exemption code) within 30 days of receipt of the invoice

43. Purchase Cards

43.1. The Corporation provides a corporate Purchase Card (P-card) service for the procurement and payment of low value goods and services. The contract, associated systems, training and policy is managed by the Chamberlain's Department but operated and administered by departmental managers.

43.2. P-cards must be used and administered in accordance with the <u>Purchase Card Policy</u> and <u>user guide</u> in Part Two of this Code.

44. Supplier Creation (Oracle System)

44.1. The Transactional Finance team in the Chamberlain's Department is responsible for supplier creation on Oracle in accordance with the guidance contained in Part Two of this Code.

44.2. E-Invoicing Policy

The Corporation's <u>E-invoicing Policy</u> confirms electronic invoicing as the preferred method of receiving invoices. E-invoicing is an efficient and cost-effective method of receiving and processing invoices.

F. RESPONSIBLE PROCUREMENT

45. Responsible Procurement Policy

- **45.1.** Officers must consider how to maximise social value and ensure risks to environmental sustainability and ethical sourcing are minimised when purchasing on behalf of the Corporation.
- **45.2.** Responsible Procurement should be tailored on a case-by-case basis considering the commitments of the Responsible Procurement Policy against the contract value and length, market maturity and what is being procured.
- **45.3.** All procurement procedures with a total contract value of £100,000 or more must allocate a minimum weighting of 15% of the overall score to responsible procurement. This includes call off contracts as a result of a framework agreement.
- **45.4.** Specifications or briefs must be developed to further the aims of the Responsible Business Strategy and Responsible Procurement Policy commitments in accordance with the guidance contained in Part 2 of the Code.
- **45.5.** All contracts below £100,000 must seek to advance the Responsible Procurement commitments in accordance with the guidance contained in Part 2 of the Code.

46. Climate Action

- **46.1.** All procurements must consider the targets of the Corporation's Climate Action Strategy in particular through purchased goods and services; buildings; transport; and climate resilience.
- **46.2.** When a procurement will result in the use of energy, all officers must seek energy efficient or low carbon solutions.
- **46.3.** As a minimum, officers must use the Government Buying Standards 'Mandatory' criteria whenever practicable the 'Best Practice' criteria, in the technical specifications, evaluation criteria and/or contract clauses for all relevant product categories. Where the Corporation has specified buying standards that go above these criteria they must be used.

47. Supplier Diversity and Local Procurement

47.1. Officers are required to invite either a UK based SME, Social Enterprise, Diverse Supplier or a local supplier from one of the Local Procurement target boroughs to quote for all relevant contracts.

48. Equity and Diversity

- **48.1.** Officers, Contractors and Sub-Contractors are required to adhere to <u>the Equality Act 2010</u> and the <u>Public Sector Equality Duty</u> as part of procurement activities.
- **48.2.** Officers should consider how social inclusion and under-representation of people with protected characteristics may be addressed as part of procurement and contract management processes.
- **48.3.** Sectors deemed high risk for equalities issues as outlined in the Responsible Procurement Toolkit must include standard specification wording and should consider evaluating suppliers on active steps taken to embed equity, diversity and inclusion within their business and industry.

49. Living Wage Policy

- **49.1.** The Corporation is an accredited Living Wage employer. There are two rates of Living Wage: one for those based in Greater London (**London Living Wage**) and another rate for the rest of the UK (**UK Living Wage**).
- 49.2. All relevant contracts must comply with the Corporation's Living Wage Policy.
- **49.3.** Officers must ensure that relevant suppliers are aware of and agree to comply with this policy at the time of award.
- **49.4.** Contract managers should make suppliers aware of the annual uplift announced in November each year and check compliance with the Living Wage Policy on an annual basis as a minimum.

50. Modern Slavery and Human Rights

50.1. All relevant contracts include the requirement for Contractors to abide by the requirements of the Modern Slavery Act 2015 and updates to modern slavery legislation. The Commercial Service must ensure that a valid URL is provided to a valid Modern Slavery Statement on the websites of all organisations in scope of legislative requirements.

Officers must have regard for high risk areas of modern slavery and other infringements on human rights as outlined in the Corporation's Modern Slavery Statement. Where applicable, standard wording contained in Part 2 of the Code should be included in specifications to ensure suppliers monitor and mitigate these risks in the supply chain. Contract managers should request evidence of monitoring and mitigation of these risks on an annual basis as a minimum.

51. Air Pollution

- **51.1.** The City of London is an Air Quality Management Area as levels of air pollution exceed health based targets. Officers and contractors must observe and adhere to the current <u>City of London Air Quality Strategy.</u>
- **51.2.** All officers must adhere to the Procurement Policy to support the Air Quality Strategy including the prohibition of diesel vehicles and the Transition to a Zero Emission Fleet Policy.
- **51.3.** For all contracts involving the use of vehicles, including delivery or construction vehicles, Officers must now include a menu of air pollution mitigation options from the list contained in Part Two, within the specification. The contractor will be asked to select one commitment as part of their offer. The menu should be adapted according to the nature of the contract.

52. Road Danger Reduction

52.1. The Corporation has agreed clear targets for reducing casualties on its streets. Contracts involving vehicles will need to include FORS accreditation as outlined in Part Two of the Code.

53. Health & Safety

53.1. The Corporation has a legal responsibility ensure the health and safety of employees, contractor's employees, and members of the public when on our sites or delivering our contracts. All suppliers delivering a contract with a clearly identifiable Health and Safety risks will need to complete a Health and Safety questionnaire or be Safety Schemes in Procurement (SSIP) accredited.

54. Biodiversity

- **54.1.** Officers must ensure that contractors do not degrade habitats hosting existing biodiversity, especially those listed in the Corporation's <u>Biodiversity Action Plan</u>.
- **54.2.** Over works FTS procurement threshold, officers must consider interventions to create habitats or resources for targets species, including green roofs, living walls, suitable plants and/or water sources.

Committee(s):	Dated:
Operational Property and Projects Sub Committee – for decision	03 July 2023
Subject: Considerate Lighting Charter adoption by Operational Property	Public
Which outcomes in the City Corporation's Corporate Plan does this proposal aim to impact directly?	1, 2, 5,11,12
Does this proposal require extra revenue and/or capital spending?	No
If so, how much?	N/A
What is the source of Funding?	N/A
Has this Funding Source been agreed with the Chamberlain's Department?	N/A
Report of: City Surveyor	For Decision
Report author: Edmund Tran, City Surveyors]

Summary

The Considerate Lighting Charter document is an Appendix to the City of London Lighting Supplementary Planning Document. The Considerate Lighting Charter gives an opportunity for building owners, operators and occupiers to make a strong commitment to manage their lighting systems in ways that make a positive contribution to the City.

It is recommend to formally adopt the Considerate Lighting Charter, as it aligns closely with the aims of Climate Action Strategy and aims to undertake the actions within a reasonable timeframe.

Recommendation(s)

Members are asked to:

- Note the report and contents of the Considerate Lighting Charter
- Approve and adopt the Considerate Lighting Charter

Main Report

Background

In November 2022, the City of London Lighting Supplementary Planning Document (SPD) was drafted and approved by the Planning and Transportation Committee for a public consultation exercise.

The Supplementary Planning Document (SPD) provides guidance for developers on lighting buildings and the spaces between them. It will help developers to meet the requirements of the Development Plan policies that relate to lighting. It covers the design, delivery, operation, and maintenance of artificial light within the City of London.

As part of the SPD, a Considerate Lighting Charter has also been drafted. The Considerate Lighting Charter gives an opportunity for building owners, operators and occupiers to make a strong commitment to manage their lighting systems in ways that make a positive contribution to the City.

For existing buildings where no new development is proposed, the City Corporation has no legal powers to enforce adherence with the Charter. Building owners, managers and occupiers would, however, incur reputational damage if they were to sign up to the Charter but not adhere to the commitments it contains. The Charter does not change or in any way undermine the City's Environmental Health function, which will continue to investigate complaints of intrusive light and take enforcement action where necessary.

In January 2020, the City of London Corporation (City Corporation) set out on a fastpaced, cross-City Corporation journey to develop an ambitious Climate Action Strategy (CAS). The Considerate Lighting Charter broadly aligns with the aims of the CAS and provides additional strategic support.

Current Position

The consultation has been completed and a final version of the SPD has been prepared, for approval at the Planning and Transportation Committee on the 18th July 2023. A final version of the Considerate Lighting Charter has also been produced and will be submitted for final approval alongside the SPD.

Officers are intending to promote the Charter and the SPD to owners, managers and occupiers of existing buildings in the Square Mile. This will be done through working with partners such as Business Improvement Districts and major landowners in the City, as well as engagement with small and medium sized businesses through the Climate Action Strategy's Heart of the City programme.

Corporate & Strategic Implications

<u>Strategic implications</u>: The Lighting SPD and Considerate Lighting Charter is in line with the aims and objectives of the City of London Corporate Plan 2018-23. This SPD will support the delivery of the Corporate Plan including by ensuring that land-use decisions fully incorporate measures to ensure people are safe and feel safe, people enjoy good health and wellbeing, and our spaces are secure, resilient and well-maintained through the planning system (Corporate Plan, Outcomes 1, 2, 5, 11 and 12).

<u>Financial implications</u>: The Considerate Lighting Charter includes recommendations, many of which constitute best practice for lighting. This will have an individual impact on future projects, for which these recommendations will serve as guidance. In many

cases, the recommendations will result in a lower operational costs. There are no commitments to fund works as part of adopting the Considerate Lighting Charter.

Resource implication: There are no resource implications arising from this report.

<u>Equalities implications:</u> The Lighting SPD will contribute to the delivery of the City Corporation's Public Sector Equality Duty 2010 by improving health and wellbeing outcomes for all people who are protected by existing equalities legislation. The SPD has been subject to an initial screening exercise which concluded a detailed Equality Impact Assessment was not needed as the SPD would not have any negative impacts on those who share a protected characteristic.

<u>Climate implications:</u> The Lighting SPD and Considerate Lighting Charter will contribute to the delivery of the Climate Action Strategy.

<u>Legal implications:</u> The Lighting SPD has been developed in line with the statutory requirements of the Town and Country Planning (Local Planning) (England) Regulations 2012.

<u>Risk implications</u>: There are no additional new risks arising from this report.

<u>Security implications</u>: There are no security implications arising from this report. Additional lighting as part of security measures are considered carefully before being implemented.

Conclusion

The Considerate Lighting Charter is considered to be reflective of current best practice for lighting in modern buildings. The targets are aspirational and commit to undertaking the actions within a reasonable timeframe – allowing departments time to adjust to these guidelines. The City of London is also preparing to promote the Considerate Lighting Charter within the square mile, and as such it is recommended that the City adopt the Considerate Lighting Charter Lighting Charter as a leader in policy.

Appendices

• Appendix 1 – Considerate Lighting Charter

Background Papers

Draft Lighting SPD, Planning and Transportation, 1st November 2022

Edmund Tran

Senior Energy Engineer, City Surveyors

T: +44 7857 665672

E: Edmund.tran@cityoflondon.gov.uk

This page is intentionally left blank

305 **Appendix A: Considerate Lighting Charter** City of London Corporation

The City of London Corporation's Considerate Lighting Charter is a set of commitments that will help to ensure that buildings and public spaces in the Square Mile achieve the right light, in the right place, at the right time.

Page

Building owners, managers and occupiers in the Square Mile are encouraged to sign up to this Charter. By doing so, they commit to undertaking the actions of the Charter within a reasonable timeframe.

These actions are the minimum required to comply with the Considerate Lighting Charter. More detailed guidance is available in the City of London Corporation's Lighting Supplementary Planning Document (SPD).

By signing up to the Considerate Lighting Charter, we commit to:



- Turning lights off when not in 1.1.**use.** Lights in unoccupied interior spaces, particularly commercial spaces, will not be left on unnecessarily. We will ensure external lighting accords with curfew times in the Lighting SPD.
- 1.2. **Installing control systems** such as passive infrared detectors (PIR) as part of a 'smart' lighting system designed in a way that minimises the amount of light used.
- Embedding good lighting 1.3. management practice in our facilities management teams and undertaking training for staff on how lighting systems should be operated.

- 2. **Review our lighting system**, 3. by:
- 2.1. Carrying out an initial review and updating it regularly, with the aim of minimising light spill, reducing energy consumption and carbon use, improving safety and character and ambience, and which considers equality, diversity and inclusion.
- 2.2. Consulting neighbouring properties, particularly those who are most affected by our lighting, as part of the review. We will publish information about changes to our internal and external lighting and provide contact details.
- 2.3. **Considering biodiversity**, through identifying the local context and adjusting our lighting system to limit impacts on biodiversity.



lighting, through avoiding cooler colour temperatures after dark; putting limits on the illuminance and brightness of external lights, and internal lighting that is visible from outside our building(s); and making external lighting efficient (in line with Building Regulations and/or BREEAM).



Minimise the impacts of our lighting, by:

3.1. Reducing glare and light spill for

internal and external lighting, through measures such as installing low-glare downlighting, louvres or blinds, and removing or reducing any internal lighting within 1.5 metres of the building façade.

3.2. Procuring sustainable light fittings

that have the minimum embodied carbon and lowest operational energy, and can be easily repaired, replaced and recycled. We will consider 'lux leasing' and other circular economy approaches.

3.3. Improving the performance of our

Page 306

This page is intentionally left blank

Agenda Item 11

Committee(s):	Dated:
Operational Property and Projects Sub Committee – For Decision Policy and Resources Committee – For Decision Bridge House Estates Board – For Decision	03/07/2023 21/09/2023 26/09/2023
Subject: Adoption of Design Standard	Non-Public
Which outcomes in the City Corporation's Corporate Plan does this proposal aim to impact directly?	5, 7, 10, 12
Does this proposal require extra revenue and/or capital spending?	N
If so, how much?	
What is the source of Funding?	Climate Action Strategy
Has this Funding Source been agreed with the Chamberlain's Department?	Y
Report of: Paul Wilkinson, City Surveyor	For Decision
Report author: Graeme Low, Energy and Sustainability	

Summary

- In the coming years, the CoLC will have to meet exacting new sustainability standards. CoLC is committed to achieving net zero emissions from our own operations by 2027 and across our investments and supply chain by 2040. One of the largest contributors to CoLC's emissions is its buildings and estate.
- This document makes the case for Committee endorsement to adopt the Design Standard (Appendix 1). It will demonstrate how the formal adoption of the Design Standard will be the quickest and most effective means of meeting CoLC's sustainability objectives.

Recommendations

Members are asked to:

- Endorse the formal adoption of the Design Standard.
- Delegate authority to the City Surveyor and CAS SRO (Director of Economic Development, Innovation and Growth) for approval of annual updates to the Design Standard.

Main Report

Background

3. CoLC is targeting a carbon emissions reduction of 84% by financial year 2023-24, rising to 96% by 2025/26. It aims to achieve net zero carbon emissions across its own operations by 2027.

- 4. Buildings represent 39% of global greenhouse gas emissions, including 28% in operational emissions and 11% in building materials and construction. (World Green Building Council)
- 5. CoLC commissioned Arcadis in May 2022 to produce Design and Technology Standards. The Design Standard was developed to accelerate action in meeting net zero targets. It has been created to support the City's the Climate Action Strategy (CAS), launched in 2021.
- 6. The Standard was produced following a comprehensive review of recognised external standards and guidance (including BREEAM, RIBA Stages and LETI). It included a review of existing CoLC policies and processes, and extensive consultation with key CoLC teams.
- 7. The purpose of the Design Standard is to embed sustainability principles on all future capital projects (refurbishments and new build) whilst meeting the highest commercially viable standards for sustainable and low carbon design and future resilience. The incorporation of whole life cycle cost and carbon analysis will support achievement of CoLC's net zero targets.
- 8. The intention is to provide a common standard across all projects. This will enable project managers and decision makers to recognise 'what good looks like' in terms of meeting our net zero targets.
- 9. The Design Standard comprises of several themes, some of which were focused projects.
- 10. Focused projects include Whole Life Carbon (WLC). The purpose was to develop a consistent approach to assessing and capturing the embodied and operation carbon for CoLC assets. Deliverables included a bespoke CoLC WLC Checklist, and pilot of the WLC Checklist on select CoLC projects.
- 11. Additionally, the Technology Standard has been incorporated into the Design Standard document. The objective was to provide a suite of technologies that meet a minimum sustainability criterion. For example, equipment that is more energy efficient and requires less maintenance.
- 12. The Standard is aligned with the GLA's Life-Cycle Carbon Assessment Guidance. It follows the methodology of the Carbon Options Guidance developed by the CoLC Planning department.

Current Position

- 13. The Design Standard has now been developed. Initially the Standard will be used as guidance. For CoLC to achieve its net zero targets and embed sustainability across the Corporation, the adoption of the Design Standard needs to be formally approved.
- 14. The Standard represents the best opportunity to establish consistent sustainability principles for application on new schemes and refurbishments.
- 15. We are currently testing the Design Standard in a series of pilot projects. The pilots will be an opportunity to refine the Standard.
- 16. All pilots are expected to be completed by the end of 2023.
- 17. The output of the pilots will support the development of thresholds to show the minimum, expected and outstanding sustainability expectations on projects.
- 18. We are actively engaged with the Programme Office to understand how the Standard can be incorporated into Project Procedure.

Options

- 19. CoLC's sustainability obligations are unavoidable. However, there are three options regarding the adoption of the Design Standard. Each will have its own costs and consequences.
 - Approve Adoption of the Design Standard (Recommended Option). Early adoption provides a wealth of benefits outlined in the table below. It will ensure that minimum sustainability standards are implemented on all projects, contribute to the net zero targets and set a strong example to public and private sector.
 - Await further evidence. This will delay CoLC's ability to meet its sustainability commitments, net zero targets and risk damage to corporate reputation and incur continued costs.
 - **Continue as Guidance-Only**. This will fail to ensure consistency and widespread adoption of sustainability across the corporation.

Benefits	Risks
Setting a leading example to Public and Private sector	Additional resource and time to fulfil the
Creating buildings that are more sustainable in design and operation	Standard requirements, this can be factored
Improving resilience of assets	initially
Designing out and reducing waste	
Contributing immediately to our net zero targets	Buy in from key
Reducing compliance costs e.g., London Plan, Part L	stakeholders e.g.,
Improving collaboration and coordination between operational and capital projects teams	project managers, FM team. Communications
Reducing maintenance and management burden on FM teams	and training will support
Introducing minimum standards on sustainability	It is anticipated that to
Future proofing assets, avoiding the need to retrofit in the future	embed sustainability on projects will cost more.
Application of a whole life approach to our assets	Factored in when
Demonstrate support the Corporation's aspiration to sign up to the C40 Clean Construction declaration	setting budgets

Design Standard Adoption: Benefits and Risks Table

Proposal

- 20. The development of the Design Standard has been funded through Climate Action and made available internally to all colleagues via the CoL intranet. Training sessions are being organised and will be offered to all relevant staff.
- 21. The pilots will be undertaken on live projects, with compliance captured via the Design Standard Tracker (Appendix 2). The tracker, general feedback and

learnings from the external project delivery team and CoLC project leads will be captured regularly and information the review and update at the end of the year.

- 22. Where interdependencies have been identified, engagement with the team leads has been planned and included in the programme for Year 3. For example, Responsible Procurement, Circular Economy and PMO to review and update their policies and processes to incorporate the Design Standard requirements.
- 23. There are a growing number of CoLC departments that have a part to play in enabling the success of the Design Standard. Adoption of the Design Standard is critical to drive action and build in sustainability into existing policies and procedures and create new ones where necessary.

Corporate and Strategic Implications

24. The adoption of the Design Standard will support the delivery of the City's Corporate Plan as follows:

5. Businesses are trusted and socially and environmentally responsible. Consistent application of sustainability principles on all projects will provide assurance through the actions CoLC is taking.

7. We are a global hub for innovation in finance and professional services, commerce and *culture*. The Design Standard is an innovative solution to adopting a holistic approach by considering sustainability in all aspects of the asset life cycle.

10. We inspire enterprise, excellence, creativity and collaboration. The Design Standard invites collaboration internally and through the external project delivery teams.

12. Our spaces are secure, resilient and well-maintained. A core objective is to future proof assets and avoid the need to retrofit.

Financial implications

25. Future development of the standard will be funded from the Climate Action Strategy. Funding provided to date is just over £500,000.

Resource implications

26. Resource funded by Climate Action will support the implementation of the Design Standard.

Legal implications

27. Statutory obligations around planning and building regulations that will need to comply with; the Design Standard will support meeting compliance requirements.

Risk implications

28. Adoption of the Design Standard will assist CoLC in meeting Climate Action Strategy targets and reduce reputational risk associated.

Climate implications

29. A consistent application of the Design Standard will support CoLC to reduce carbon emission from its buildings and reduce its impact.

Equalities implications - None

Security implications - None

Conclusion

30. Action on sustainability is unavoidable. CoLC is targeting a carbon emissions reduction of 84% by financial year 2023-24, rising to 96% by 2025/26. It is this report's recommendation that endorsement of the adoption of the Design Standard will be the quickest and most effective means of meeting CoLC's sustainability objectives. Early adoption will ensure that minimum sustainability standards are implemented on all projects, contribute to the net zero targets, strengthen corporate reputation, and set a strong example to public and private sector.

Appendices

- Appendix 1 Design Standard Document
- Appendix 2 Design Standard Tracker Document

Graeme Low

Head of Energy and Sustainability

E: graeme.low@cityoflondon.gov.uk

This page is intentionally left blank





Net Zero Design Standard

Building blocks of net zero design

The Net Zero Design Standard is critical to accelerate our transition to net zero across our housing, corporate and investment portfolios and realise our resilience goals.

"

DIRIGE CITY LONDON

- **O1** Why Climate Action, Why Now?
- **02** Introduction
- **03** Interactive User Guide & Structure
- **04** Standard Requirements

Appendix 1 - Net Zero Technology Use

Appendix 2 - References

Appendix 3 - Abbreviations



Document Functionality

This document is designed as an interactive PDF to enhance the user experience. Throughout the document the reader is offered hyperlinks to relevant sections to enable a more seamless enriched experience and quickly find what they are looking for. It uses infographics throughout to minimise the need for text and gives an easy-to-understand overview of a topic. The document addresses accessibility requirements where possible. Please note that the table size is small and requires users to zoom in to see. Further guidance on functionality and the relevant symbols are presented on the right.



Click this symbol anywhere in the document to go to Chapter Summaries page with links to other parts of the document.



This symbol denotes text hyperlinks to relevant sections in the document



Use this symbol to go to the Interactive User Guide for Design Standards



Use this symbol to go to Process Requirements Table



Use this symbol to go to Project Requirements Table



Use this symbol to go to Information Requirements Table



Use this symbol to go to the Interactive User Guide for Appendix 1: Net Zero Technology Use

Chapter Summaries

01. Why Climate Action, Why Now?

A forward from the City of London Corporations' (CoLC) Climate Action Programme Director outlining why the Design Standard has been developed.

02. Introduction

This chapter introduces the Climate Action Strategy (CAS), along with the CoLC's commitments and the part the whole organisation will play in achieving these.

03. Interactive User Guide & Structure

This chapter provides users with an interactive user guide to navigate around the Standard. Hyperlinks take users to the key requirements which make up the main body of the document.

04. Standard Requirements

This chapter outlines who the Standard is aimed at, who should use it and when. It confirms the Standard should be used throughout the life cycle of a project and provides descriptions of the main user and stakeholders / project delivery team.

Go to Chapter

Go to Chapter

Contraction Go to Chapter

 \bigcirc

Go to Chapter

Go to Appendix 1: Net Zero Technology Use

Provides further details on the application of technologies to support with the transition to net zero carbon across the CoLC estate.

Go to Appendix 2: References

Presents the sources of industry good and best practice which were used to develop the process, project and information requirement tables - split by Design Guide sub-categories.

Go to Appendix 3: Abbreviations

Full detailed list of all acronyms used within the Design Standard.

"

// Building Blocks for Net Zero

01. Why Climate Action, Why Now?

A foreword from the City of London Corporations' (CoLC) Climate Action Programme Director outlining why the Design Standard has been developed. The City of London Corporation has adopted a radical Climate Action Strategy, which breaks new ground and sets out how the organisation will achieve net zero, build climate resilience and champion sustainable growth, both in the UK and globally, over the next two decades.

Buildings and Infrastructure are responsible for 25% of the UK's greenhouse gas emissions. Therefore, how they design, refurbish, and develop new buildings is critical to delivering on the net zero and resilience goals. By introducing the Net Zero Design Standard, they intend to accelerate this transition across their housing, corporate and investment portfolios. The new Standard will complement the Housing Design standards, and the to be developed, Sustainability Supplementary Planning Guidance for the Square Mile and beyond.

This document sets out the Design Standard we have developed. The Standard looks across the whole life cycle of the development process and targets a longer-term focus on both cost and natural resource use efficiency. The Standard will provide designers and developers with consistency in the definition of good practice and greater clarity on the delivery of environmentally sound and cost-efficient buildings, facilities, and overall high sustainability performance across the asset life cycle.

Grace Rawnsley Climate Action Programme Director



"

// Building Blocks for Net Zero

02. Introduction

This chapter introduces the Climate Action Strategy (CAS), along with the CoLC's commitments and the part the whole organisation will play in achieving these.

Page

32

INTRODUCTION

London is a world leader in climate action, the City of London Corporation (CoLC) are proud to have developed a radical Climate Action Strategy (CAS), which breaks new ground and sets out how they will embed climate action in everything that they do and work within the latest standards and advice. The CAS targets for the CoLC form the basis of these Design Standards, the implementation of these robust design standards across all property groups will be an essential mechanism to ensure that all works support the achievement of CAS targets. The Vision, Aims and Goals are:

Through the Climate Action Strategy, CoLC commits to achieving:

- Net zero by 2027 in CoLC's operations
- Net zero by 2040 across the CoLC's full value chain
- Net zero by 2040 in the Square Mile
- Climate resilience in buildings & public spaces

In the context of climate action, the City of London will support the achievement of net zero, build climate resilience and champion sustainable growth to create a truly sustainable City. This will be achieved via numerous commitments within their Corporate Plan 2018-23, which will drive their performance. The actions reflect ongoing work in supporting innovation and growth in the financial and professional services sector and relate to the first six years of the strategy. The strategy and action plan will then be refreshed for the next phase of implementation to achieve the City of London's 2040 goals.

Everyone within the Organisation and wider value chain has an important part to play in making this vision a reality. The organisation therefore recognises the scale of the challenge and the urgent need to realise sustainable outcomes that will assist the communities in thriving.



322

SCOPE

This Design Standard (herein called 'the Standard') provides CoLC Project Managers (PM), Project Delivery Teams, Designers and other Stakeholders with consistent sustainability and resilience guidelines and expectations at all stages of future and new build developments and major refurbishments for CoLC's operational and investment portfolio.

Application of this Standard will mitigate risks of underperforming buildings and support CoLC to embed net zero requirements across new construction, planned refurbishments and/or replacing plant and systems at end of life – this will help ensure they are all 'net zero ready'. For the purpose of this Standard the definition of Net Zero is ensuring that both emissions from construction and operation are balanced by removal out of the atmosphere (UKGBC, Net Zero Carbon buildings: A framework definition, April 2019). To focus their approach and ensure the developments are aligned to the City of London's Vision, they have introduced a set of outcomes which have underpinned the development of this Standard.

To ensure the outcomes are achieved, the Standard includes sustainability requirements, within six Design Standard Categories (Whole Life Carbon, Circular Economy, Materials, Resilience, Wellbeing, and Post Occupancy Evaluation (POE)), for integration at all stages of the asset lifecycle across CoLC's operational and investment portfolio. More information on the Design Standard Categories is found in the next section of this standard.

RESILIENCE

Protect CoLC assets through implementation of future proofing measures into new developments and refurbishments, mitigating the need to go back to assets later to complete additional retrofit activities.



NET ZERO

Embed net zero behaviours when delivering new buildings and planned refurbishments.



OPERATIONAL EFFICIENCY

Improve building performance through energy efficiency improvements, by delivering carbon reductions across CoLC Operational and Investment assets. From a management perspective the asset lifecycle encompasses every stage from first identifying a need for the asset (new build or refurbishment) through to disposing of the asset once it has reached end of life. CoLC staff should also note that for planned stock changes, CoLC staff must check whether there are any initial targets in place, noting that any planned stock changes need to perform to contribute to the CoLC 2027 net zero targets as well. The four stages of an asset's life cycle are defined as follows for this Standard:

 Planning and Procurement: Establishing the requirements of an asset, based on the evaluation of existing assets, managing Capex and procurement, and acquiring the right goods and services. By aligning with the RIBA Stages, the Standard will inform PMs of the relevant requirements at each of the early life cycle stages and support them in informing the design to reach net zero and improve the asset. PMs should also make use of the CoLC Procurement Code and the Responsible Procurement Policy. The POE category will also provide teams with lessons learnt for future projects.

• **Operation / In use:** Reviewing the performance of the building in operation against the design and acquisition decisions. Carrying out upgrades, repairs, compliance audits, and cost analysis based on the asset performance reviews. (The Whole Life Carbon and Wellbeing categories allow PMs to look at ways of improving working and living environments as well as enabling building to become more efficient in operation).

Maintenance (including improvement

works): Activities that help optimise the performance and extend the asset's lifespan, including servicing, repair and addressing critical failures (several categories including Materials and Resilience will inform PMs on relevant criteria required here, as well as signposting the Technology Standard where key technologies are discussed). See **Appendix 1**. **Disposal / Decommissioning:** Effectively monitoring and controlling 'end-of-life' process when the asset needs to be disposed of, repurposed, or recycled in line with the Circular Economy Principles. (The Standard details Circular Economy requirements enabling PMs to make informed decisions about the individual assets). "

// Building Blocks for Net Zero

03. Interactive User Guide & Structure

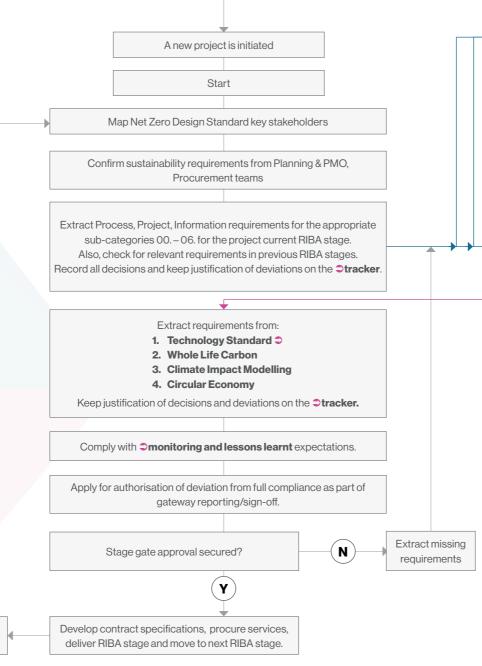
This chapter provides users with an interactive user guide to navigate around the Standard. Hyperlinks takes users to the key requirements which make up the main body of the document. It outlines the six main categories and sub-categories and the key sources that have been utilised to create the Standard. 03. Interactive User Guide & Structure

The Interactive User Guide allows users to navigate through this Standard to find tables of requirements (**Process, Project**, and **Information Requirements**) which contain detailed information that will support integration of sustainability requirements projects. The requirements are aligned with the RIBA Stages and CoLC Gateways (Figure 1).

Click the relevant symbol to go into required sub-category.

Go to the **OUseful contacts** if you have specific queries.

Extract requirements for the next RIBA stage



START			
	•	•	•
	PROCESS	PROJECT	INFORMATION
00. ACCREDITATION			
Sustainability rating	-	•	•
⇒ 01. WHOLE LIFE CARBON			
Whole life cycle carbon		•	•
Embodied carbon Resource efficiency	•	•	•
Operational carbon / energy	•	•	•
LZC technologies	-	•	•
Carbon reduction		•	•
Energy Efficiency	•	•	•
Minimise Pollution		•	•
Minimise Carbon	-	•	•
⇒ 02. CIRCULAR ECONOMY			
Decommissioning	-	•	•
Circular economy		•	•
Resource efficiency		•	•
○ 03. MATERIALS			
Low impact materials		•	•
Procurement of materials	-	•	•
Material durability	•	•	•
Modern methods of construction		•	•
○ 04. RESILIENCE			
Climate change adaptation		•	•
Biodiversity, ecology, conservation		•	•
Flood resilience	-	•	•
Local air quality	-	•	•
Passive design	•	•	♦
⊃ 05. WELLBEING			
Community centric approach		•	•
WELL type requirements	•	•	•
Resource efficiency	•	•	•
○ 06. POST OCCUPANCY EVALUATION	ΓΙΟΝ		
Energy and Water Monitoring	-	•	•
RETURN		I	

The specific requirements for each Design Standard Category are presented in three tables throughout this document, as follows:

 \bigcirc

Process Requirements: defines key decision points aligned to RIBA stages and apply to a range of key stakeholders.



Project Requirements: includes information for each sustainability category to be reviewed and applied as applicable. i

Information Requirements: details what needs to be recorded to evidence how the requirements have been applied.

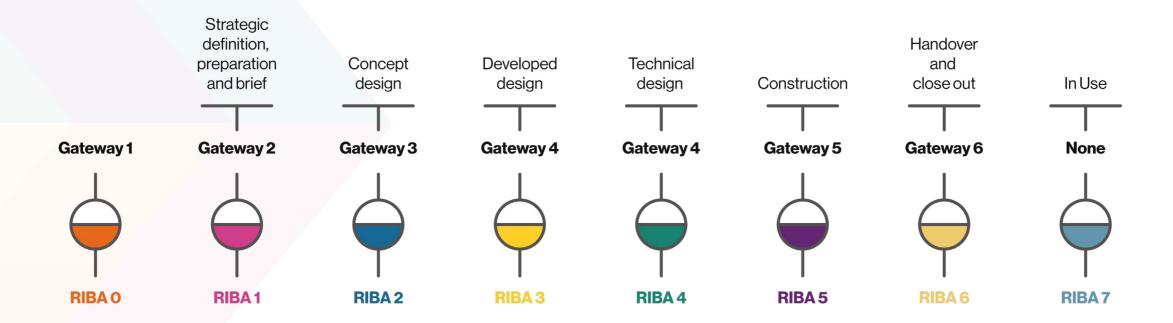


Figure O1 Standard alignment with RIBA Project Delivery Stages and City of London

DESIGN STANDARD CATEGORIES

The Standard offers specific requirements in six key sustainability themes (Whole Life Carbon, Circular Economy, Materials, Resilience, Wellbeing, and Post Occupancy Evaluation (POE) – please see Figure 2). These are further divided into Sub-Categories. The Technology Guide is provided in **Appendix 1** to this Standard.

The sustainability requirements specified for each Design Standard Category, draw on a wide range of information sources, including:

- National and international standards.
- Information developed as part of the wider Climate Action Programme.
- Existing CoLC policies, procedures, and other internal supporting documentation e.g.
 The Housing Design Standard, and Project
 Procedure – please see the **Procedure** for a full list of these.

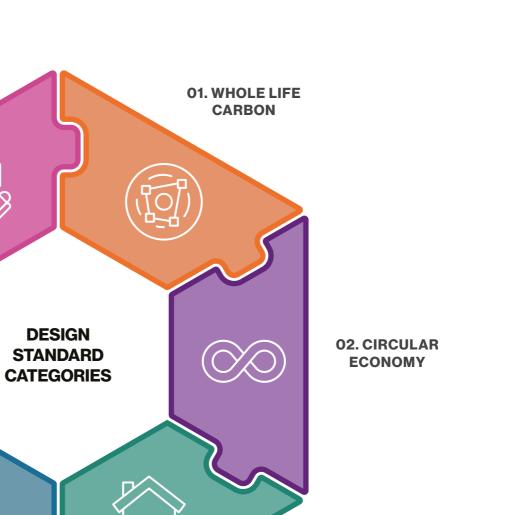
 Studies commissioned by CoLC (e.g. Climate Impact Modelling, Whole Life Carbon Assessments).

The Technology Guide, which includes guidance on technology performance requirements and technology standards and is included as **Appendix 1** of this Standard. Where this Standard refers to Technology requirements for the asset, please refer to this section.

Included at the end of this document is a full reference list, along with recommended further reading, are provided in **Appendix 2** & **3**.

As requirements will vary between projects and building types and classes, information is presented to enable users to select the requirements that are appropriate for each project.





03. MATERIALS

05. WELLBEING

06. POST

OCCUPANCY

EVALUATION

04. RESILIENCE



Accreditations

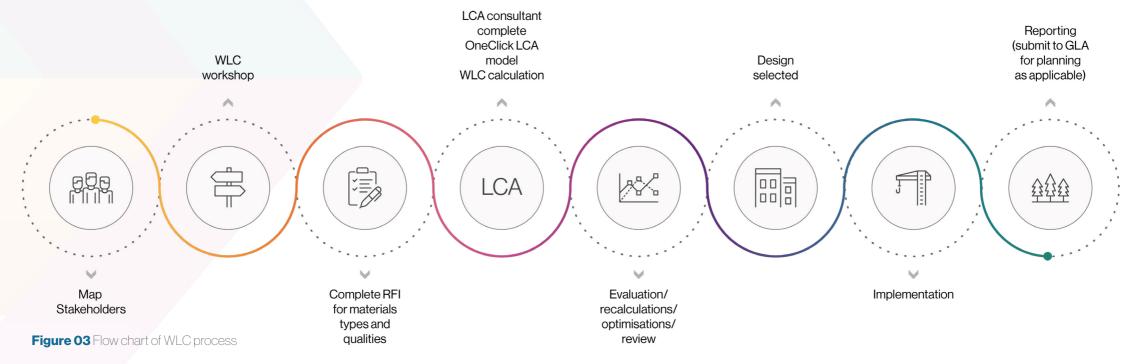
This section focusses on four key sustainability ratings/green building certifications: BREEAM, SKA, NABERS and Home Quality Mark. These have been selected as they are internationally recognised and have a science-based complement of validation and certification options. **The Process Requirements** section provides details to support selection of the most appropriate sustainability rating for each project.

The scope of the six categories and associated sub-categories within the Standard are summarised below. It should be noted that not all the sub-categories will be relevant or applicable to every project and neither will all assets be able to achieve all the requirements and criteria. It will depend on the scope of works involved, asset and class type.



DESIGN CATEGORY 1. WHOLE LIFE CARBON

Whole Life Carbon (WLC) encompasses the total carbon emissions resulting from the extraction, transportation, and manufacturing of materials, as well as construction, operation, maintenance and demolition phases of a building over its entire lifecycle. This includes both embodied carbon, and carbon emissions associated with operational energy from both regulated and unregulated energy use. A WLC approach seeks to identify overall the best combination of opportunities for reducing lifetime carbon emissions. Reducing carbon intensity by using life cycle carbon and cost assessment techniques will support the achievement of net zero. Applying a WLC approach to the project will help to identify carbon intense materials, equipment, and other activities both in construction and operation which can be addressed early and minimised – please see Figure 3 for a WLC process.

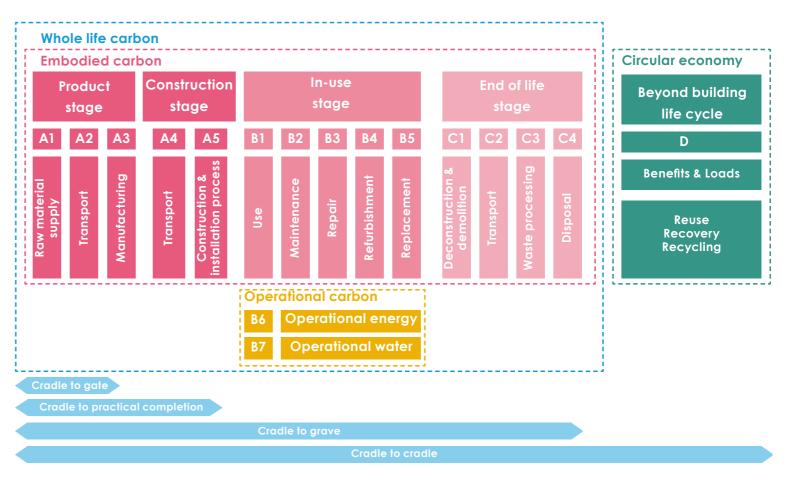


Page

331

The RICS professional statement: Whole Life Carbon Assessment for the Built Environment, released in 2017, should be followed for WLC assessments across the CoLC portfolio, fully considered and incorporated into the CoLC WLC Checklist. The methodology aims to standardise assessment and enhance consistency in outputs by providing guidance on implementing EN15978: Sustainability of Construction works.

Embodied and operational carbon emissions should be assessed across life cycle stages A1-C4 (Figure 4) for a lifecycle of 60 years. The emissions from the product stage (A1-A3), also known as cradle to gate, on average contributes the largest proportion of emissions to an embodied carbon assessment. This includes the raw material supply, transport and manufacturing required to produce a product. The LETI Climate Emergency Design Guide (2020) estimates that 80% of embodied emissions from small scale housing developments are attributed to A1-A3 stages, but only 48% in commercial office developments. In use stages B1-B5 are the next highest contributors to embodied carbon, including the maintenance and replacement of materials. Therefore, selecting the right material is key to lowering embodied carbon emissions across a development's life.





In this guidance, building elements that should be recorded are broken down according to the New Rules of Measurement classification system:

- 1. Substructure
- 2. Superstructure
- 3. Finishes
- 4. Fittings, furnishings and equipment (FF&E)
- 5. Building services/MEP
- 6. Prefabricated Buildings and Building Units
- 7. Work to Existing Building
- 8. External works

1a) Whole Life Carbon Assessment

The objective of a WLC assessment is the mitigation of the carbon impact of the built environment. WLC will enable a better understanding and consistent measurement of the WLC emissions of built projects. This in turn will allow result comparison, benchmarking and target setting to achieve Net Zero. Carrying out a WLC Assessment will provide carbon emissions data that can be targeted for reduction opportunities through the project stages, resulting in lower carbon impact through construction, during operation and at end of life of the asset.

CoLC have developed a **SWLC Assessment**

Checklist to capture the WLC at each RIBA stage of the project. The analysis required to undertake an accurate and robust WLC assessment is complex and detailed, and PMs must review what information is required at each stage and utilise the checklist within the WLC tool. Production of a CoLC WLC Assessment will require use of a WLC related tool/software e.g., OneClick LCA software.

To gain a broader understanding of the CoLC approach to WLC on projects, please see the Whole Life Carbon Assessments undertaken by BDP [BDP, Whole Life Carbon Assessments, July 2022 doc ref COL-BDP-XX-XX-RP-Y-00001]. A portfolio of six sample CoLC live projects, including new build and refurbishments, offices and a café. The CoLC WLC Assessment checklist was then completed for each project. Optimisation scenarios were modelled to quantify £ per kgCO2e saving for each optimisation measure. Across the samples assessed by BDP, an average CO2e saving of 122.65 per m2 of development could be achieved if all optimisation measures were implemented. The cost savings range from £0 per kgCO2e (changing cooling set points of controls at Broad Street Place) to £214.60 per kgCO2e (triple glazed windows to lower g value at Eldon Street). The BDP report generated a menu of optimisation measures that can guide future projects to adopt measures that have low cost per kgCO2e saved (see section 1d for further details).

1b) Embodied Carbon

Embodied carbon comprises of all the GHG emissions associated with building construction, including those that arise from extracting, transporting, manufacturing, and installing building materials on site, as well as the operational and endof-life emissions associated with those materials. (McKinsey, Data to the rescue: Embodied carbon in buildings and the urgency of now article, September 2020).

Upfront embodied carbon is emissions associated with the extraction and processing of materials, the energy and water consumption used by the factory in the production processes and constructing the building.

Best practice targets set out in the Project Requirements for embodied carbon should be met, and embodied carbon assessments should reflect all items listed in the project's Bill of Materials in accordance with the Circular Economy category. A Life Cycle Assessment (LCA) tool such as OneClick LCA can be used to assess the embodied carbon for a project, allocating Environmental Product Declarations (EPDs) to material elements based on the proposed specification. EPDs are produced by product manufacturers and identify the carbon emissions of a product.

Embodied carbon should be assessed in line with BS 15978:2011 and the RICS Professional Statement, covering the following life cycle stages:

- A1-A3: Product Stage
- A4: Material transportation to site
- B4-B5: Replacement and maintenance
- C1-C4: End of Life

1c) Operational Carbon

The operational carbon emissions arising from the energy use of building-integrated systems as projected and/or measured throughout the life cycle of the project. (**PRICS, Whole life carbon assessment for the built environment, 2017, P29**). A result of the energy consumed for the day-today operation of the building or structure and will usually include carbon emissions associated with heating, hot water, cooling, ventilation, and lighting systems, as well as those associated with cooking, equipment, and lifts (i.e., both regulated and unregulated energy uses).

- Regulated Energy: Energy consumed by a building, associated with fixed installations for heating, hot water, cooling, ventilation, and lighting systems.
- 2. Unregulated Energy: Energy consumed by a building that is outside of the scope of Building Regulations, e.g., energy associated with equipment such as fridges, washing machines, TVs, computers, lifts, and cooking.

Operational carbon emissions are calculated based on CIBSE TM54 analysis, encompassing carbon emissions related to both the regulated and unregulated energy uses accumulated over the 60year study period. A CIBSE TM54 analysis relies on detailed occupancy patterns and equipment, lifts, catering schedules (where applicable).



1d) Minimising Carbon

Minimising carbon is the use of less carbon-intense solutions to operate the same equipment and / or perform the same task to produce the same result. Carbon reduction measures can include reduction in both embodied and operational carbon. This category also includes, energy efficiency, and minimising pollution measures. Technical solutions to support the reduction of carbon can be found in **Appendix 1**.

Modelling of scenarios should be completed early in the design process to optimise carbon reduction measures. In the report completed for CoLC by BDP [BDP, Whole Life Carbon Assessments, July 2022 doc ref COL-BDP-XX-XX-RP-Y-00001], four scenarios were modelled to quantify recommended carbon reduction measures:

3. Baseline: WLC impact resulting from the original design proposal.

4. Optimised Operational Carbon Scenario:

WLC impact resulting from a combination of optimisation measures that aim to reduce operational carbon emissions.

5. Optimised Embodied Carbon Scenario:

WLC impact resulting from a combination of optimisation measures that aim to reduce embodied carbon emissions.

6. Optimised Operational and Embodied Carbon:

WLC impact resulting from a combination of optimisation measures that aim to reduce both operational and embodied carbon emissions.

The report outlined key measures that could be implemented to provide cost and carbon savings. The savings were presented in £ per kgCO2e saved.

Operational optimisation measures:

- 1. Improved HVAC and electrical efficiencies, prioritising natural and passive ventilation.
- 2. Improved lighting efficiency.
- 3. Selecting Photovoltaics with greater efficiencies.
- 4. Improved fabric insulation
- 5. Operational management, e.g. increasing cooling set point temperature.

Embodied optimisation measures:

- 1. Reuse existing structure where possible, either as is or reusing dismantled materials.
- 2. Reduce live load allowances to reduce the weight of the structure and the need for structural strengthening, thereby reducing the volume of material required.
- 3. Select materials with lower embodied carbon:
 - a. Insulation, such as cellulose fibre insulation.
 - b. Fermacell board instead of gypsum.
 - c. Concrete with higher Ground Granulated Blast-furnace Slag (GGBS).
 - d. Reclaimed steel, or where not feasible, EAF steel.
 - e. Timber frame or CLT and steel with benefits of reduced weight and sequestering carbon.

4. Design for disassembly and reuse, for example using precast concrete elements. It is recommended that CoLC facilitate a circular economy across their portfolio, by repurposing materials from buildings undergoing change in other projects nearby.

Low and Zero Carbon (LZC) Technology

Using Low and Zero Carbon technologies to generate renewable energy results in the reduction of CO2 emissions as well as the conservation of fossil fuels. These technologies are significantly more efficient than traditional solutions and emit less carbon in providing heating, cooling, or power.

Further information on the technologies and components to support the minimising of operational energy and the introduction of LZC technology can be found the Technology Guide in **CAppendix 1** of this Standard.



 \bigcirc

DESIGN CATEGORY 2. CIRCULAR ECONOMY

Circular Economy is characterised 'as an economy that is restorative and regenerative by design, and aims to keep products, components and materials at their highest level of utility and value at all times, distinguishing between technical and biological cycles' (Ellen McArthur Foundation).

The key considerations in the application of Circular Economy (CE) on projects are detailed in the CE the **Project**, **Process** and **Information Requirements tables**.

For assets approaching the end of life, CE Principles should be applied to look at the options for reuse of the asset, refurbishment options and potential for reuse of materials, Post Occupancy Evaluations (POEs) may also support the process. A CE Statement is currently applicable for referable developments. However, for CoLC new developments and refurbishments, we see it as best practice that a Circular Economy Statement is developed with a level of detail proportionate to the scale of the development, and the CE Principles applied.

The Greater London Authority set out a vision of London transitioning to a circular economy in the Circular Economy Statements (2022) and London Plan (2021).

- The Environment Strategy presents four strategic approaches – including 'Low Carbon Circular Economy', where 'A low carbon circular economy is one in which as much value as possible is extracted from resources, through their use and reuse, before they become waste...'
- The London Plan 2021 promotes the adoption of circular economy (CE) principles in development, including designing out waste, designing for adaptability, design for longevity and design for disassembly, reuse, and recycling.

The Mayor of London's **Design for a Circular Economy Primer'** recognises the importance of the built environment's transition to the circular economy in addressing the challenge of the climate emergency and is intended to help support organisations in the built environment sector understand how they can embed circular economy principles into their projects and design processes. For buildings, this means creating a regenerative built environment that prioritises retention and refurbishment over demolition and rebuilding. It means designing buildings that can be adapted, reconstructed, and deconstructed to extend their life and that allow components and materials to be salvaged for reuse or recycling. Designing buildings for a circular economy can increase their value by avoiding depreciation and can help to stave off obsolescence. It can even secure a positive residual value at end-of-life. In a circular economy, built environment assets are designed so that whole buildings, and materials, components and parts can be continually and easily recycled.

The **Design for a Circular Economy Primer**

provides a summary of circular economy principles and practice with guidance on project level circular economy strategy approach.

Technical guidance for the London Plan 2021 policy SI7, '**⊃Reducing waste and supporting the circular** economy' outlines the direction of the technical guidance to follow. CoLC are also developing their own CE Strategy, and this is currently a work in progress.

It is further understood City's Code of Practice for Deconstruction and Construction Sites 9th Edition 2019 is currently being updated and there will be further links to Circular Economy within this. It also stipulates that any project with a value of over £300k is required to produce a Site Waste Management Plan (SWMP) for new build, maintenance, and alteration or installation/removal of services (such as sewerage or water).

2a) Resource Efficiency

Resource efficiency is an aspect of the circular economy approach – and means 'doing more with less and delivering greater value with less input'. However, unlike the circular economy, resource efficiency does not necessarily challenge the linear 'take, make, use, dispose' model of consumption and production.

2b) Waste Reduction

As the largest user of materials and generator of waste in the economy, the built environment sector must take a lead in supporting the shift towards a circular economy. In London, the sector consumes 400 million tonnes of material each year and accounts for more than half of waste. More efficient use of resources and waste reduction has the potential to deliver a range of sustainability benefits.

2c) Decommissioning

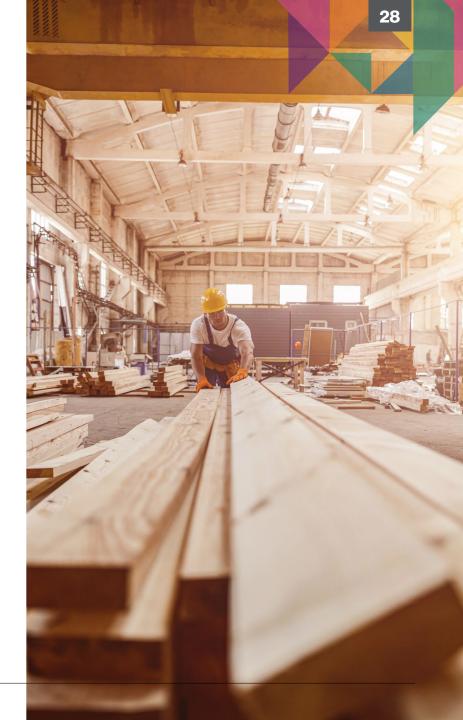
The circular economy requires consideration of opportunities to keep products, components, and materials at their highest utility and value always. In the context of a building this includes consideration opportunities to retain utility through design approaches such as modular construction, design to allow future disassembly as well as retention of value through design to facilitate refurbishment, reuse, and recycling.

DESIGN CATEGORY 3. MATERIALS

This category provides guidance on ways to reduce the environmental and social impact of materials used on a project. It takes a 'cradle to cradle' approach to assess the impacts of materials used in the built environment. The issue focuses on material efficiency, environmental impact, responsible sourcing, and material durability. Materials and associated waste from these can increase a projects carbon emissions and contribute to global warming. The building and construction industry in 2021 accounted for over 34% of energy demand and c. 37% of energy and process-related CO2 emissions. A reduction in material use, and smarter use of these materials, as well as those with low impact and an efficient life cycle will contribute to net zero targets and reducing the impact buildings have on the environment. PMs and the project team should also consider material reuse, and once available review the work by Hawkins Brown being

instructed by CoLC which includes a materials selection matrix and design notes.

Material specification, selection, and consideration is integral to creating a sustainable building. It is highly dependent on contextual factors of the building, with several metrics playing a role in identifying the most suitable material of each building element. For example, there may be a need to review retention of existing materials and investigate alternative materials against the technical and performance standards, carbon requirements, and further, identify and factor in specific materials lifespans. Sustainable materials options are improving year on year, including the level and availability of EPDs. Material requirements are fully explored and explained in the Design Standard (sub)categories in accordance with the state-of-art industry standards.



To assist CoLC PMs and their architect/Project Delivery Team in making conscious sustainable material choices, it is recommended that lowimpact material specifications are consulted when considering material options for all schemes. Below are links to current externally recognised lowimpact material specifications.

- Carbon Assessment for the Built Environment' (whole life carbon assessment)
- CE (Inventory of Carbon and Energy)
 Database (embodied energy and carbon database)
- Carbon assessment)
 Carbon assessment
- Description
 Descript
- SKA Rating Good Practice Measures (responsible sourcing)

As a minimum, PMs should read through the different material specification methodologies in the links for further details. They should then discuss with their architect and project team the main project requirements for materials i.e., is carbon reduction most important, or responsible sourcing of materials, or both. This will help guide the project lead in making decisions on the relevant methodology to follow. They should also ensure they understand CoLC Procurement Policies and procedures and work closely with the Procurement team and architect for the project. It is not expected a PM will prepare or write a materials specification, but they should understand the different approaches and be able to discuss options with their architect who will prepare the materials specification for the project and contractor to follow. Materials specification is an evolving area and there will not be a 'one size fits all' approach as each project is individual and will have different material requirements and aspirations.

3a) Low Impact Materials

Low impact materials have the lowest whole life carbon impact while performing the function required. It may, however, be the case that higher embodied carbon materials are chosen due to their roles in reducing operational carbon over a building's lifetime. Projects should identify materials that can be re-used/recycled (demolition and refurbishment) and designing future buildings for disassembly and material re-use. Other considerations include selecting locally sourced, low-carbon and sustainable materials and a material efficiency and longevity review prior to selection.

3b) Procurement of Materials

Procurement of materials defines the relationship between the various parties in the process of researching, selecting, ordering, and paying for the materials required for construction of a building or structure. Initially this could include undertaking pre-demolition/pre-refurbishment audits to e.g., find opportunities for material re-use and introduce a sustainable procurement approach to procuring materials, including minimum expectations for materials. Further is the consideration of ethically sourced materials which means ensuring human rights and employment rights are both met to a high standard. Further information can be found in the CoLC Responsible Procurement Policy and acts in accordance with the Procurement Code. highlighting the CoLCs commitment to identify areas of spend where there may be a high risk of poor working conditions, modern slavery, forced labour, human rights abuse, material sourcing from conflict-affected areas or negative impacts on security and crime. Human rights due diligence

assessments will be carried out in the CoLC supply chain and there is continuous commitment to improvement, refection on existing and emerging legislation and guidance.

There will be an essential relationship with partner organisations such as the Ethical Trading Initiative and Electronics Watch to ensure the transparency of the mining and manufacturing of minerals used in the provisions of electric vehicles batteries and state-sponsored forced labour risks.

3c) Material Durability

Investing in sustainable and durable materials can help lessen the environmental impact and improve the building's lifecycle. At the design stage of the projects, aspects such as the adaptability/flexibility, disassembly, material resilience and exposure to premature end of life should be considered.

3d) Modern Methods of Construction (MMC)

Modern methods of construction employ innovative practices which spans off-site, near site and on-site pre-manufacturing, process improvements and technology applications, to minimise waste and energy usage. Some examples include modular offsite construction, creating panelled or cassette units in factories which can be assembled on site and the use of low impact materials. At the early stages of the project, consider opportunities to deploy MMC.

DESIGN CATEGORY 4. RESILIENCE

The Intergovernmental Panel on Climate
Change (IPCC) definition of resilience: "Capacity
of social, economic, and environmental systems
to cope with a hazardous event or trend or
disturbance, responding or reorganizing in ways
that maintain their essential function, identity, and
structure, while also maintaining the capacity for
adaptation, learning, and transformation".

The CoLC Climate Action Strategy (CAS) sets out how the CoLC will achieve net zero, build climate resilience and champion sustainable growth, both in the UK and globally.

Through the CoLC CAS workstreams including Resilient Buildings workstream which covers Climate Impact Modelling, Greener Streets and Cooling, CoLC are proactively considering and addressing action necessary to mitigate the worst climate change. This Design Standard Category sets out the principles to be applied to achieve climate resilience, further information can be found in CoLC CAS, and CoLC Climate Impact Modelling documents.

For refurbishments and depending on the building type and works involved; consult the Buildings Resilience Plan initially to check if the building is included as a priority asset with proposed resilience intervention measures. Where assets are part of the Buildings Resilience Plan, include the intervention measures as part of the refurbishment, working with the relevant internal teams e.g., Asset Manager to ensure that resilience is fully encompassed. If they are not part of the Buildings Resilience Plans advice is to strongly consider including these within the scope as relevant.

For acquisitions, ensure that the due diligence followed has been designed to assess vulnerability to climate impacts. This will help to identify any necessary investment required to ensure that asset is well-adapted to changing climatic conditions. It is recommended that a climate risk assessment is produced for all new developments and refurbishments, this will inform PMs on what is required to protect a building and tailor it to the asset type. Please refer to the Climate Impact Modelling work for further details.

4a) Climate Change Adaptation

Climate change adaptation is the approach of adjusting to actual or expected climate events to mitigate or moderate harm. The output of the Climate Impact Modelling work undertaken by CoLC showed insight into the anticipated impacts of heat stress and flooding on the Square Mile; enabling CoLC to put measures in place to better protect assets, the environment, and people from harm. Intervention measures include retrofitting and managing open spaces through permeable surfaces and increased tree planting, as well as solar shading, improved building fabrics and air tightness. These measures can limit the hazards and associated climate risks from heat stress, fluvial and pluvial flooding, each of which could affect CoLC assets. Benefits of adopting a climate mitigation and adaptation approach when creating new developments or refurbishing existing building include, the opportunity to improve biodiversity and social value, increase the value and improve the space.

4b) Biodiversity, Ecology and Conservation

Biodiversity provides an opportunity for improved resilience to the impacts of climate change through measures such as Blue and Green Infrastructure. Future developments and refurbishments should contribute to local biodiversity, aligning with local and national government policies and adhering to species' protection status. The biodiversity impacts of potential interventions must be assessed and measured to ensure alignment between climate and biodiversity outcomes.

4c) Flood Resilience

Being prepared, ready to respond and able to cope with and recover from a flood event is known as 'Flood Resilience'. Resilience can be achieved through undertaking Flood Risk Assessments which will identify areas more vulnerable to flooding. Resilience measures such as flood defences and Sustainable Urban Drainage Systems (SUDS) can be introduced to mitigate and manage the effects of flooding. The climate impact modelling of the Square Mile illustrates the current and future heat stress and flooding projections, this data can inform decisions and interventions to protect the asset making it more resilient.

4d) Local Air Quality

Poor air quality is detrimental to human health and wellbeing. Harmful substances caused by gases such as Nitrous Oxide reacting with other gases and environmental factors, can have major health impacts such as affecting respiratory function and increasing instances of heart disease. CoLC is committed to reducing local air pollution through design and monitoring to improve air quality for occupants, visitors, and the local community. How air quality internally and externally and ventilation will be implemented, monitored, and managed for CoLC buildings should be a key consideration for all CoLC schemes.

4e) Passive Design

Passive design is design that works with the local climate to maintain a comfortable habitat within buildings. Passive design uses building layout, fabric, and form to reduce or remove mechanical cooling, heating, ventilation, and lighting demand.

DESIGN CATEGORY 5. WELLBEING

The relationship between human health, wellbeing, and the built environment are intertwined. This includes both physical and mental impacts of buildings on the wellbeing of occupants and users. CoLC is committed to providing a clean environment, access to nature, and celebrating responsible practices to improve wellbeing for all its building users. This category provides applicable features to elevate wellbeing for all and community engagement towards responsive, inclusive, and adaptable environment. Further information could be found in **CoLC CAS** and WELL V2 standard. Applying a wellbeing, people centric approach on new developments and refurbishments demonstrates CoLC's commitment to wellbeing. The relevant sub-categories are summarised on the right:

5a) Community Engagement

Community engagement is the process of working collaboratively with groups of people with a shared interest or situation to address issues affecting the wellbeing of those people. It may involve partnerships across stakeholders such as the public, councils and developers working together to reduce the vulnerability of their area to the impact of climate change through mitigation and adaptation, such as improving provision for recycling, energy management and protecting those vulnerable from increased temperatures and flooding, as well as ensuring and promoting ethical sourcing practices for both materials and labour. There are many opportunities throughout the lifecycle of the asset to engage with a plethora of stakeholders from the public, such as through consultations with suppliers and employees. The benefits of regular engagement will support the creation of assets that meet the needs of end users.

5b) WELL Type Requirements

The WELL Building Standard is a performancebased system for measuring, certifying, and monitoring features of the built environment that impact human health and wellbeing. The requirements are based around air, water, nourishment, light, fitness, comfort, and mind. They encourage a holistic approach to health and the built environment, addressing behaviour, operations, and design. An example of Air WELL requirements is to minimise the sources of indoor air pollution by aligning design with Particulate Matter and Volatile Substances standards. Taking a wellbeing approach to the development of an asset can help to ensure a healthy building with happier tenants. Page

346

DESIGN CATEGORY 6. POST OCCUPANCY EVALUATION (POE)

This category encourages a more holistic approach in managing the asset beyond handover. It is recommended that the Project Manager remain involved, this include developing post occupancy requirements prior to the project being completed, identifying the key areas to evaluate the performance of the building. Early engagement with the building manager/FM/tenant e.g., to gauge user experience and to understand whether the Net Zero Design ambition has been achieved in operation. The POE can help improve a buildings operation and occupants' comfort based on its outcomes. It can also be used to improve design and efficiency of future projects and will provide detailed lessons learnt for the CoLC team and year on year improvement for their assets. At a minimum it is recommended that a POE is undertaken annually. There are several different POE approaches that can be followed, including as part of the BREEAM Man 05 Aftercare credit requirements.

6a) Operational Carbon and Energy

Please see **Design Category 1c**

6b) Embodied Carbon

Please see **Design Category 1b**

6c) Energy and Water Monitoring

Energy and water monitoring systems can be installed within buildings to accurately measure both the energy and water usage of a site via sub metering systems and smart meters This information can then inform the Operations Manager whether the sites energy and water usage is within target or whether additional initiatives need to be introduced to minimise usage such as encouraging users to change their energy usage behaviours on site. Water monitoring systems are also able to identify leaks and can automatically shut off when a leak is identified to reduce water usage. CoLC uses a centralised system called "Team Sigma" to collect data for energy and water monitoring.

6d) Local Air Quality

Please see **Design Category 4d**



"

// Building Blocks for Net Zero

04. Standard Requirements

This chapter outlines who the Standard is aimed at, who should use it and when. It confirms the Standard should be used throughout the life cycle of a project and provides descriptions of the main user and stakeholders / project delivery team. It defines the reporting, assurance and sign-off process and offers guidance around filing structure, lessons learnt and continuous improvement and how the Standard will evolve and be updated. Lastly, there is a list of key contacts for help and assistance.

WHO SHOULD USE THE STANDARD

The Standards primary purpose is for use by CoLC Project Managers. It identifies the actions required and evidence that needs to be collected to demonstrate the requirements have been implemented. However, the information herein will also be of value to other CoLC stakeholders including the CoLC Chief Officers and Planning Team. Further information on how to use this Standard can be found here: **How to Use This Standard.**

This Standard is to be applied throughout the life cycle of the asset from design to end of life. To ensure the potential of the asset can be fully realised, key stakeholders and subject matter experts (SMEs), must be identified and engaged early. Figure 5 illustrates the key stakeholders within the Project Delivery Team and as presented in the **Project**, **Process**, and **Pinformation Requirements** Tables which contains more detail on the role of each key stakeholder at each of the RIBA Stages.





Figure 06 Standard Defined Roles & Requirements

Figure 05 Net Zero Design Standard Project Delivery Team

Page

349

Project Manager

The CoLC Project Manager (PM) has a significant part to play in ensuring that the requirements of this Standard are met, this starts at RIBA Stage 0 and continues to the end of RIBA Stage 7.

At RIBA stages 0 and 1, the PM's role involves liaising with the Client Team/Project Management Office (PMO) and Senior Responsible Officer (SRO), who's role is to determine the viability of the project, costs and prepare the project brief. It is important that in advance of commencing RIBA stage 2 that the PM is satisfied that the project set up has been appropriately to enable successful delivery. The handover at this stage should include confirmation of sufficient funding and resources and that supplier contracts via discussions with Commercial Services are inclusive of the responsibilities in relation to meeting the requirements of the Standard, e.g., completing Whole Life Carbon Assessments.

Key to successful implementation is communication of the requirements to the Project Delivery Team at the start and working with the team at each stage of the project to ensure the Standard is followed, information is gathered and recorded consistently and timely; to demonstrate how the key areas are being addressed.

CoLC Project Managers must familiarise themselves with the Standard, including their role in meeting the requirements, this includes early and regular engagement with the relevant stakeholders at each stage (RIBA Stage (0-7) / Gateway (1-6)).



Project Delivery Team

The Project Delivery Team is appointed by the Project Manager and are shown in Figure 5. Each member has an active role in delivering key elements of this Standard, detailed in the **Project**, **Process** and **Information Requirements** Tables.

Other Stakeholders identified as having a role in supporting the delivery of the Standard are noted below, these stakeholders should familiarise themselves with the requirements to support the PM and successful delivery of the project.

- CoLC Corporate Project Management Office
 (PMO)
- Senior Responsible Officer (SRO)
- Client Teams
- Commercial Services
- CoLC Members

Project Delivery Team & Key Stakeholders	Description what is required of each role to do to deliver sustainable buildings effectively
Architect / Designer	An organisation or individual, advised by specialist consultants and sub-contractors, whose business involves preparing or modifying designs for construction projects. Works with PM to drive design forward and assist the PM in the appointment of consultants at the right RIBA Stage. Review Standard requirements RIBA 0-6.
Building Surveyor	Provides a detailed evaluation of an asset's condition through extensive inspection. Works with the PM to inform works required on the asset and assist with any risk assessments required e.g., climate risk. Review Standard requirements RIBA 0-2.
Contractor	Builds / constructs or provides refurbishment works in the building. Employs or engages sub-contractors based on capability and availability and price. Interprets requirements of design team and may influence selection of products and design. Works with PM to ensure delivery of Standard criteria and achieve net zero. Review Standard requirements RIBA 4-7.
Fire Engineering	Applies scientific and engineering principles, and expert judgement, to protect people, property, and the environment from the destructive effects of fire.
Interior Design Services	Involved in the design or renovation of internal spaces, including structural alterations, furnishings, fixtures and fittings, lighting, and colour schemes. Works with PM to drive design forward and review Standard requirements RIBA 2-6.
M&E Engineer	Designs the Mechanical and Electrical components through integration, co-ordination and collaboration with consultants, contractors, and specialists. M&E ensures that their designs satisfy performance requirements and are safe and serviceable. Work with the PM to drive MEP design forward and ensure successful delivery of net zero. Review Standard requirements RIBA 0-6 including the Technology Guide in Appendix 1 utilising the BAT checklist.

Where Client Teams/SRO lead on initial stages of the Project (RIBA Stage 1 and 0), in advance of CoLC PM involvement, it is recommended that the Client Teams/SRO engage with the PM or Project Management Office at the start of this process as this will facilitate the smooth transition to implementation.

Project Delivery Team & Key Stakeholders	Description what is required of each role to do to deliver sustainable buildings effectively
PassivHaus Designer / Certifier	Consults delivery teams how to achieve the Passive House standard. Quality assurance is achieved through certification by a registered PassivHaus Certifier. Works with PM to ensure achievement of PassivHaus has a positive impact on the achievement of the net zero Standard.
Quantity Surveyor / Cost Consultant	Influences and guides the selection of building products. Early in the construction project they will give advice on costs, helping establish total spend for project completion. Works with PM closely to create cost plan and appoint consultants and review Standard requirements RIBA 0-2.
Structural & Civil Engineer	Responsible for foundations and general structures and associated infrastructure of a building. They monitor the progress of a project and inspect the work and advise contractors. With additional qualifications they become Structural Engineers who design the skeleton or structure of a building. Work with PM to ensure delivery of Standard criteria and achieve net zero. Review Standard requirements RIBA 0-4.
Sustainability Consultant	Assesses sustainability risks or needs of the building based on its location, policies and regulations and defines performance requirements. Prepares and completes any relevant accreditations and helps drive the delivery of the Standard to successful completion with the PM.
Transportation	Provides improved access to local amenities and to sustainable means of transport, i.e., public transport and other alternative transport solutions for building users. Encourages locations and solutions that support reductions in car journeys and, therefore, congestion and CO ₂ emissions over the life of the building. Review relevant subOcategories within Standard and help towards successful completion.

Page

352

WHEN TO USE THIS STANDARD

The Standard has been developed to embed sustainability and resilience across the CoLC Operational and Investment Building Assets (herein referred to as 'Assets' and 'Buildings'), providing a consistent approach and good design practices to:

- Be applied to CoLC new construction and major refurbishments.
- Be flexible enough to be applied across a broad range of buildings, using a range of delivery, operating and maintenance routes across CoLC.

The Standard will help to maximise the opportunities, minimise risk, cost and avoid retrofitting in the future by providing guidance on design decisions and technology choices. To be effective Standard implementation must occur at project inception, mobilisation of key stakeholders and early engagement of the Project Delivery Team will support early adoption.

Implementation of the Standard is aimed at all projects categorised below with full details in the **Project**, **Process**, and **Information Requirements** Tables.



Figure 07 Mandatory implementation of listed categorised projects

Page

353

At project initiation and regularly throughout the project stages, it is important that the CoLC PM engages with relevant CAS project workstreams and CoLC departments, building in reviews and references to the CoLC standards and procedures and other requirements e.g., Project Management Guidance, Planning, etc., this will ensure cohesion across the CoLC requirements.

The CoLC PM at the start of the project must engage with the Project Delivery Team and communicate the requirements and define how and when information will be recorded and shared with CoLC.

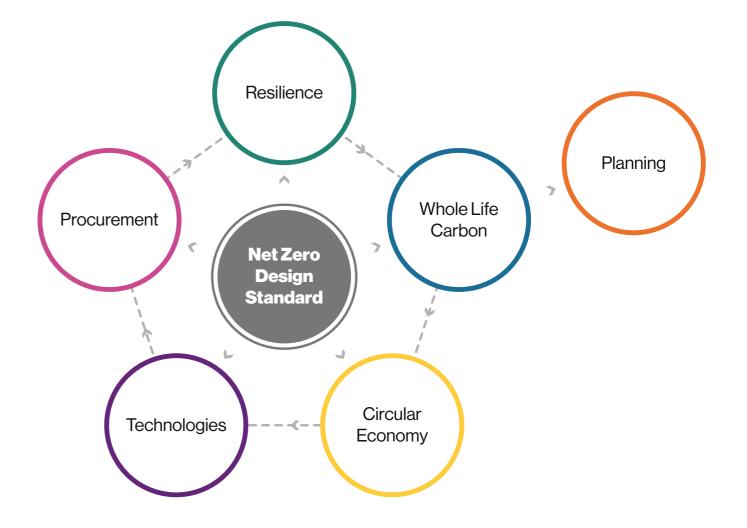


Figure 08 An illustration of the interdependencies with the Net Zero Design Standard

Interdependencies

The Standard provides users with an overview of and access to the tools and supporting information to embed sustainability on projects. The Standard is not intended for use in isolation, several key interdependencies have been identified as illustrated in Figure 8, as previously outlined above, early and continuous engagement with these teams within CoLC is essential. Key CoLC documents and processes as shown in Figure 9, should be reviewed in conjunction with the relevant section in the sustainability requirements.

A WLC Assessment tool is available for CoLC users on how to develop robust and consistent Whole Life Carbon Assessments for a range of building types. The analysis required to undertake an accurate and robust WLC assessment is complex and detailed, and PMs must review what information is required at each stage and utilise the checklist within the WLC tool.

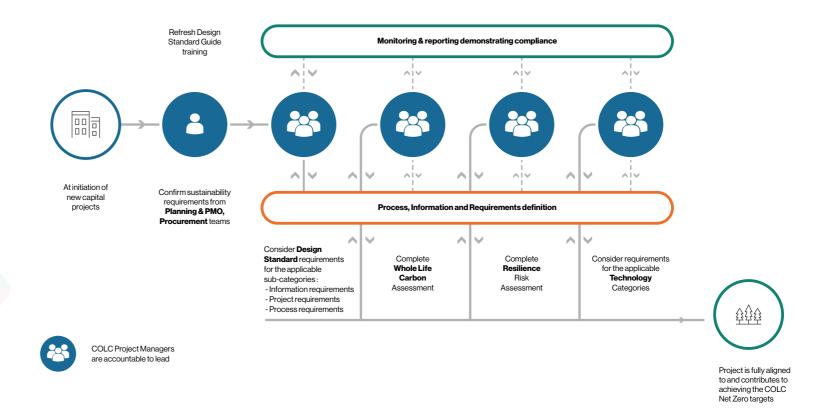


Figure 09 Process steps to gather sustainability requirements and align to CoLC targets

The Resilience or Climate Impact work involved risk modelling for CPG and IPG Assets on temperature and pluvial / fluvial flooding to identify high risks assets with the need for enhanced resilience and mitigation measures. The exercise, which is still in progress at the time of writing, aims to identify a set of proposed interventions and any constraints which need assessed and considered.

The Technology Guide which is an Appendix to this Design Guide offers a Best Available Technology selection tool (BAT) and covers categories including fabric, airtightness, HVAC (heating, ventilation, and air conditioning) systems, lighting, equipment, controls and components within the future maintenance, refurbishments, and construction of building projects. It provides guidance on the selection of equipment and technological solutions to support project managers and suppliers to specify the optimum technology in terms of performance, technical viability, lifetime costs and carbon emissions, considering both embodied and operational carbon.

The Carbon Options Guidance (which includes third party review of the options appraisal at preapplication stage) on Whole Lifecycle Carbon Optioneering is aimed at developers intending to build in the Square Mile. It provides guidance about how the planning process can encourage the development pathway towards net zero as set out in the CAS. This Standard is aligned with the methodology of the Carbon Options Guidance which in turn aligns closely with the GLA's Whole Life-Cycle Carbon Assessment Guidance. The purpose of the Carbon Options Guidance is to encourage the appraisal of development options for different degrees of major interventions in the commercial built environment as part of the pre-application process to ensure that planning application proposals for the Square Mile are designed with a maximum reduction of whole lifecycle carbon emissions and to drive best practice. This exercise should be clearly presented in the planning application documents.

Full (major) planning applications should aim to follow this guidance wherever possible as it offers a methodology to satisfy the requirements of the GLA's guidance on Whole Life-Cycle Carbon Assessments and Circular Economy Statements to fully explore and consider options for retaining buildings and structures. The methodology establishes the minimum data required at the pre-planning and planning stages, and the level of transparency to be disclosed to CoLC. A dashboard has been created to equip CoLC with easy, visual, and quantified information that is clear and benchmarkable, enabling an informed discussion between them and the Applicant party.

The Whole Life Carbon category has integrated the guidance stated in the Carbon Options Guidance, and GLA's new guidance on WLCA reporting (March 2022) accordingly. It is noted that this category will need to be updated as the market matures, and industry standards and assessment tools become more robust and reliable.

PROCESS, PROJECT, AND INFORMATION REQUIREMENTS

The Standard offers specific requirements for six Design Categories (Whole Life Carbon, Circular Economy, Materials, Resilience, Wellbeing, and Post Occupancy Evaluation (POE), which are presented in three tables herein, Process, Project, and Information Requirements Tables.

Each table should be reviewed in turn for each category and sub-category. The user should start with Process Requirements to understand what should be done when and by whom; secondly to the Project Requirements which details the set criteria to be achieved for net zero; and thirdly the Information Requirements which confirms the types of documentation and evidence to demonstrate compliance. Using the tables in this way will help ensure successful completion of the categories and that all requirements are met.

Process Requirements (>Link to Table)

Process requirements summarises expectations around net zero key decisions which need to be taken throughout the delivery of new buildings, planned refurbishments, listed buildings, and/or replacement of building components and systems to ensure implementation of the information and project specific design requirements. Further, this section enables project delivery teams and PMs to identify additional stakeholders and milestones in line with the RIBA project stages of work. The requirements are presented and aligned to RIBA and CoLC Gateways to support the PMs and their project delivery teams in considering how and when these activities and works should be implemented throughout the project lifecycle.

Project Requirements (CLink to Table)

Project requirements provides project managers (PMs), and their project delivery teams (designers, architects, engineers, etc.), with consistent project requirements and set criteria to apply to the delivery of new construction, planned refurbishments, Listed Buildings, and/or replacement of building components and systems at end of life. The aim is to achieve net zero carbon goals, ensure a high build performance and integrate these into current CoLC roles and responsibilities as set out in the CoLC Project Management Guide. The requirements are informed by available Industry Standards, Regulations, and guidance as well as existing CoLC documentation to ensure alignment and prevent contradictions. The project requirements not only act as a baseline of minimum requirements for net zero, but actively push project delivery teams to superior benchmarks and net zero buildings.

i Information Requirements (⊃Link to Table)

Information requirements outlines the reporting requirements to evidence how an individual project demonstrates their compliance to net zero. The information requirements are clearly set out corresponding to the above Project Requirements as well as aligning with CAS KPIs. Having set information requirements allows for quality control management and the ability for CoLC to actively measure and analyse a projects successful achievement of net zero.



	Topics	Ap	plicability		Strategic definition, preparation and brief	Concept design	Developed design	Technical design	Construction	Handover and close out	In Use	Considerations	Interde	ependencies
			Value	Gateway 1	Gateway 2	Gateway 3	Gateway 4	Gateway 4	Gateway 5	Gateway 6	None		c	CoLC
				RIBA 0	RIBA 1	RIBA 2		RIBA 4	RIBA 5	RIBA 6	RIBA 7	Stakeholders involved / instructed		
				4	٠ ـ	√	1	√	√	√	√	Project Management Client Senior Responsible Owner		(e)
	Categories	50k		√	√ √ √	1	4		√	1		Building Surveying Quantity Surveying		esilien
	ea agonos	10W £21	эчк - Е im - £5(bove £!				√ √		√ √	√ √		Architectural Structural and Civil Engineering		dling (r
		pe 53	3 ដ <		1	۲ ۲	√ √	√ √	√	√		Mechanical & Electrical Engineering Fire Engineering	rbon	# Mode
					1	۲ ۲	۸ ۱		√	٠ ٠	√	Interior Design Services PassivHaus Design Transportation	logies Life Ca	e Impa r Econ
						· · · ·		1	1	4	1	Contractor	Techno	Climate
GO BACK	Introduction and A	Accreditati	ions											
					 PM / consultant: Feedback from post occupancy evaluation, precedent review data, site surveys, and experience of facilities management team to state clear, deliverable and ambitious sustainability outcomes in project brief. 	Strategy, Cost Plan, metering, site waste, and other project	 Architect, M&E and Structures to undertake design studies and engineering analysis to test sustainability outcomes. 	 Architect, M&E and Structures to undertake technical design, including final specifications and material sourcing, to manufacture and construct building to achieve sustainability outcomes. 	1. Contractor to manufacture, construct and commission the building to meet target sustainability outcomes.	 PM to hold a project performance session with the project team to gather views on process of embedding sustainability outcomes in briefing, design and construction and handover. 	1. PM to comply with in use planning conditions in relation to sustainability.			
				2. PM: Roles and responsibilities to be agreed and assigned within the project team.	 PM: Certification requirements to be clearly defined, including timetable for assessor appointments and early stage client actions. 	2. PM consider benchmarking and quality assurance requirement in initial design work.	2. M&E (PM) to submit building regulations application and interim certification applications.	 PM / Architect to coordinate design team and specialist subcontractors' manufacturing information, construction information and final specifications, embedding the target sustainability outcomes and plan for use strategy. 	2. Contractor to commission all equipment required to monitor sustainability outcomes.	 Contractor and Sustainability Consultant to provide induction and training of building users and facilities managers with reference to sustainability strategy. 				
				 PM: Sustainable innovation opportunities in design and construction to be identified. 	3. PM appoint relevant licensed Assessors or sustainability consultants and BREEAM APs as appropriate.	3. Architect and PM to incorporate lessons learnt from POE feedback and the review of precedents in developing architectural			 Contractor to review construction stage changes, report and mitigate any deviation. 	 PM to begin gathering feedback through light touch POE of sustainability outcomes in use. 	3. PM to undertake more detailed POE as required to test delivery of the in use			
	Sustainability rating	v	1 1 1		APS as appropriate: APS as appropriate: APM to engage with planning officers (where application required), at pre- planning application stage, application stage and conditions stage - impact or	concept. 4. M&E to carry out sufficient energy and other modelling to test	feedback and review of precedents, and record new lessons learnt. 4. PM to identify and update record of performance risks	 PM to include sustainability performance targets in tender information or employer's requirements and review 	A Contractor to compile construction stage information required for certification, and demonstrate compliance with		sustainability outcomes. 4. PM to share feedback from lessons learnt with client, users, design and construction team	Intentionally left blank		N/A
				within the strategic brief. 5. PM to engage with planning officers (where	timeframes and project specifications, and needs to be managed.	delivery of sustainability outcomes.	any deviation from sustainability outcomes.	tender returns or contractors proposals against sustainability outcomes.	sustainability outcomes.		members, and project stakeholders.			
				application required), at pre-planning pulces (where application required), at pre-planning application stage, application stage and conditions stage - impac on timeframes and project specifications, and needs to be managed.		 Architect to review architectural concept against the intended sustainability outcomes and report and mitigate any deviations. 		 Architect and M&E to miligate or control as many building performance and climate change impact project risks as possible and identify management strategies for those that remain. 						
						PM to include a record of key design decisions in the stage report.	 PM with Sustainability Consultant / Assessor to include a record of key decisions to deliver sustainability outcomes in stage report. 	 M&E with sustainability consultant / Assessor address sustainability outcomes targets and submit the building regulations application. 	 PM and contractor to review and update the record of performance risks on site, and use it to identify and avoid defects. 					
GO BACK						 PM to engage with planning officers (where application required), at pre-planning application stage, application stage and conditions stage - impact on timeframes and project specifications, and needs to be managed. 			 Contractor to implement handover and aftercare Contractor to compile asset information required for effective performance and management of building for building manual. 					
	Whole life o	e carbon				1				1				
				1. PM: WLC Carbon Optioneering exercise (in accordance with CoLC PAN) carried out at earliest		1. PM with design team to provide more detailed analysis of the	 MEP / carbon consultant complete in depth analysis of building components, identify materials, products and lifectants to canarate a whole life carbon budget 	1. Carbon concultant finalise carbon reduction option list		1. Contractor to confirm the final carbon related				
	Whole life cycle carbon	~ ~			 PM: Set initial embodied carbon targets and implications as part of optioneering. 	options around the key building systems (including substructures, superstructures, finishes, MEP, landscaping) and the relationship	baseline.	2. PM with carbon consultant set targets within the Main	Contractor achieve the agreed carbon reduction targets. Contractor report as-built embodied carbon on a quartert basis.	data to the LCA specialist.	1. Contractor with PM report lessons learned, good practice to the CoLC.	Intentionally left blank	1 1	1
	assessment			PM: for any for planned stock changes, PM must check whether there are targets in place, noting that	2. PM: Early recommendations on low carbon options ahead of RIBA Stage 2	 with the building's proposed performance. 2. MEP and PM identify opportunities to reduce embodied carbon and whole life carbon with the design/project team. 	5.Garbon consultant produce whole life carbon budget,	procurement. Issue request for Information to suppliers to collect carbon data to provide a supplementary information for supplier selection.	basis.	completion carbon report which should align desig stage carbon targets with what was achieved at the end of construction.	 Carbon reduction strategy to include in-use and end-of-life stage. 			
				any planned stock changes need to perform to contribute to net zero targets.			building, carbon reduction target, and carbon reduction option list.							
							1. LCA specialist or design team to include requirements and targets for WI C in specifications and	1. PM with design team finalise requirements and targets						
						1. PM use CoLC CAS, Design Standard, Technology Standard,	tender documentation at start of procurement. 2. PM to discuss with potential contractors and	for WLC in specifications and tender docs at start of procurement.	1. Design Team to engage with contractors to reduce waste 2. LCA specialist review alternative products and materials					
				1. PM: Whole life carbon ambitions to be discussed with client	1. PMdevelop a client brief to incorporate embodied carbon reduction targets based on the CoLC CAS, Design Standard, Technology Standard, and Whole Us October Ordinary Control Cont	Whole Life Carbon Optioneering, and rule of thumb guidance during concept to maximise opportunities for low carbon design.	subcontractors around WLC targets, asking for options on improvement and including carbon questions on tender return forms.	 PM finalise requirements with potential contractors and subcontractors around WLC targets, asking for options for improvement and including carbon questions on 	selections proposed by contractor against WLC requirements.	 LCA specialist undertake post completion analysis using as-built info to assess upfront embodied carbon. 	1. Recommendations regarding embodied carbon reduction strategy over the in-use stage			
	Embodied carbon	~ ~		2.PM rReview opportunity for retention of existing structure and building fabric and how quantum of	Life Carbon Optioneering. 2. PM appoint LCA specialist or design team member to be responsible for WLC assessment.	 LCA specialist or design team to analyse carbon reduction options for building elements using numerical analysis (i.e., dynamic solution model (DSM) using IES, TM54 methodology, 	 LCA specialist or design team to continue numerical analysis and use material guides to optimise material specification. 	tender return forms.	 LCA specialist / Contractor prepare post-completion analysis by collecting numerical data throughout construction phase. 	Contractor should confirm final carbon related data to LCA specialist at end of site works. Develo	should be followed throughout building life cycle including end of life stage.	Intentionally left blank	1 1	~
				materials in new building can be reduced with wider team.	 LCA specialist or design team should set initial embodied carbon targets using CoLC CAS, Design Standard, Technology Standard, Whole Life Carbon Optioneering, rule of thumb guidance and benchmarking. 	One Click LCA). 3. LCA specialist or design team to provide more detailed analysis of options around key building systems as design develops and	 LCA specialist conduct in depth analysis of elemental and component parts of entire building, identifying 	 LCA specialist update WLC budget to include design development and finalise carbon reduction options list. 	 LCA specialist to send RFIs to suppliers to receive construction carbon data and verify environmental credentials. 	practical completion carbon report. Align design stage carbon targets with what was achieved at en of construction.				
					- r	discuss with team through workshops.	specific materials, products and lifespans to generate WLC budget baseline. 5. LCA specialist assess low carbon alternatives to	 LCA specialist send pre-procurement RFI to suppliers to collect carbon data in order to provide supplementary info for supplier selection. Review RFIs and analyse 						
							baseline and agree the carbon reduction targets based on the Guide's requirements.	environmental credentials of procurement options.						
								1. M&E to update building energy model with latest design amendments and ensure that operational energy		1. PM, M&E and Contractor to review final construction including rectification work, for quality				
							1. M&E to refine a full operational energy model for evaluation of predicted energy demand. Ensure this	targets are being achieved. Document detailed targets and strategies to achieve these targets e.g. by creating a	1. PM where possible, ensure the appointment of a clerk of works is responsible for quality sheeks	including in-situ thermal performance tests, thermographic and air tightness testing.				
				4 DM Identifies Met Zees Oosters shared as within		1. M&E with architect to develop the concept design in accordance with critical design parameter recommendations in the set of the control of the set of	simulation goes beyond regulated energy and considers energy use from all items in the building.	Building Performance Register. 2. Architect and M&E to confirm envelope specification and complete detail design, ensuring good continuity of	in the design or assumptions behind it and reject substitutions and omissions if achieving performance target	 M&E to finalise as-built energy model to account for any changes in the design or accountions. 	1. PM with FM to ensure for the first year of			
				 PM identify a Net Zero Carbon champion within design team or external consultant. PM identify project team responsibilities with lead 	 PM set of clear intent for Net Zero carbon targets and define what this includes, document boundaries and targets. M&E to establish energy use intensity target, which aligns with this Design 	this guide. Specific aspects to consider at this stage include: •Building orientation •Building form factor	 M&E to test proposed design changes using the energy model. M&E to update and document detailed targets and 	insulation and airtightness. 3. M&E to iterate demand response model with exact design data to gain a more accurate prediction of carbon	may be compromised by the changes. 3. PM to engage with the supply chain regarding the design targets of the project and where possible provide toolbox	 Contractor to ensure commissioning and testing is fully completed and witnessed and that the 'as installed' controls strategies, setpoints. 				
	Operational carbon and	J J		designer / architect in order to achieve operational energy use targets; including the calculation of operational targets, documenting assumptions behing	Standard recommendations, and embed within the brief. 3. M&E to discuss localised energy constraint issues with Distribution Networ	•Eacade glazing ratio	strategies to achieve these. Include design measures and assumptions of likely occupancy patterns and operating scenarios as well as strategies for long term	savings and monetary gains. Ensure that specified equipment can integrate fully to carry out demand	talks to help upskill contractors and to communicate the importance of quality construction.	commissioned flow rates, metering etc. are in line with the energy model.	accuracy of targets as well as improving building operation.	Intentionally left blank	~	
	energy			these, managing risks and validating in-use performance.	Operator. 4. M&E to identify likely eligible demand response programmes at a national and regional scale.	 M&E to develop a preliminary operational energy model aligned to the Energy Use Intensity targets. Use this model to guide 	adaptability. 4. M&E with Procurement to ensure proposed	4. PM and M&E to include operational energy targets in	monitoring processes in place to ensure proper installation insulation, airtightness layer and mechanical equipment for	and understands use of the building systems.	trends match operating hours.			
				 PM identify a project team member who can advise on demand response. 	5. M&E to Incorporate data disclosure into BIM requirements.	design throughout RIBA 2. 3. M&E to implement the most significant carbon/ energy reduction measures in design including demand response and	and airtightness performance characteristics. 5. M&E to ensure that the risk of overheating has been	Performance type of target and feedback loop. 5. PM with M&E incorporate in contractors' prelims with	 Contractor carry out benchmark inspections to clarify quality expectations and continue to monitor construction 	response activities occur correctly as part of the commissioning process and that the initial setup	consumption data to a public data platform for			
						energy storage opportunities.	assessed and mitigated. 6. M&E to develop demand response strategy and	register are changed or value engineered, to demonstrate that 'as built' project meets agreed operational targets.	quality, including in-situ thermal performance tests, thermographic and air tightness testing.	 Contractor with M&E to ensure a suitably qualified individual understands the energy 				
							omorate potential militate.	 PM and M&E to create risk register and confirm responsibility for managing this during construction and commissioning. 	 PM and M&E to ensure the contractor understands the commissioning requirements. 	management and measurement systems. For further information regarding role and duties, refer BBP better metering toolkit.	0			
								-						
	energy			operational targets, documenting assumptions behind these, managing risks and validating in-use performance. 3. PM identify a project team member who can	Operator. 4. M&E to identify likely eligible demand response programmes at a national and regional scale.	Technical systems integration. 2. M&E to develop a preliminary operational energy model aligner, to the Energy Use Intensity targets. Use this model to guide design throughour RIBA 2. 3. M&E to implement the most significant carbon/ energy reduction measures in design including demand response and	operating scenarios as well as strategies for long term adaptability. 4. M&E with Procurement to ensure proposed construction details are robust to support low energy and airtightness performance characteristics. 5. M&E to ensure that the risk of overheating has been assessed and mitigated.	response processes and events easily. 4. PM and M&E to include operational energy targets in the construction tender package, e.g. using a Design for Performance type of target and feedback loop. 5. PM with M&E incorporate in contractors prelims with guarantees to recalculate energy model. Items in the register are changed or value engineered, to domostrati that 'as built' project meets agreed operational largets. P. PM and M.E. to creater sike register and confirm	4. PM with M&E input to ensure the contractor has quality monitoring processes in place to ensure proper installation insulation, airlightness layer and mechanical equipment for the whole of the construction period. 5. Contractor carry out benchmark inspections to clarify quality expectations and continue to monitor construction quality, including in-situ themat performance tests, thermographic and air tightness testing. 6. PM and M&E to ensure the contractor understands the	 Contractor to ensure the building user is trained and understands use of the building systems. Contractor to ensure that planned demand response activities occur concertly as part of the commissioning process and that the initial setup parameters are recorded. Contractor with M&E to ensure a suitably qualified individual understands the energy management and measurement systems. For further information regarding proise and duttes, refer 	trends match operating hours. 3. FM to upload total energy and heating energy consumption data to a public data platform for first 5 years post-completion		J	

>



	Topics		Applica	bility		Strategic definition, preparation and brief	Concept design	Developed design	Technical design	Construction	Handover and close out	In Use	Considerations	Interdepe	ndencies	
			Valu	9	Gateway 1	Gateway 2	Gateway 3	Gateway 4	Gateway 4	Gateway 5	Gateway 6	None		Col	.c	
					RIBA 0	RIBA 1	RIBA 2	RIBA 3	RIBA 4	RIBA 5		RIBA 7	Stakeholders involved / instructed			
					√ √	۲ ۲	1	1	√	√	√	√	Project Management Client Senior Responsible Owner	(euc	Ĩ	
	Categories	20K	E .	E E		4	4	4			4		Building Surveying Quantity Surveying			
	Gategories	w £2t	0K - E	1 - £5(ove £5		л И				1	√		Architectural Structural and Civil Engineering	in a c	5	
		bek	£25	£5rr Abc	E5n Abi		√ √	√ √	↓ ↓	√ √	√	√		Mechanical & Electrical Engineering	n dodell	~
								√ 	۰ ۱ ۱	√	√	√	Fire Engineering Interior Design Services	es Carbo	u ouo	
						√ 	1	√ √ √					PassivHaus Design Transportation	ologi e Life	ar Eo	
											1	1	Contractor	Techn Whole	Procu	
LZ	ZC technologies		V	√ √	 PM identify project team responsibilities with lead designer / architect to achieve operational energy generation/ use targets and carbon emission reduction targets through the renewable source. 	 PM set clear intent for zero carbon targets and define what this includes, document boundaries and targets. M&E to set a renewable energy generation and carbon reduction target within the brief. M&E to discuss localised energy constraint issues with DNO. M&E to discuss include demand response programmes at a national and regional scale. Incorporation of data disclosure into BIM requirements. 	 M&E to complete a Low Zero Carbon feasibility study to establish the most appropriate LZO source for the building. M&E to establish clear renewable energy generation and carbo reduction target, document targets and strategies to achieve this and share with all stakeholders. 		amendments and ensure that operational energy targets are still being achieved. Document detailed targets and strategies to achieve these targets e.g. by creating a Building Performance Register 2. PM and M&E include renewable energy generation an carbon reduction targets in the construction tender package, e.g. using a Design for Performance type of target and feedback loop. 3. PM and M&E input incorporate in contractors' prelims with guarantees to specify and installed the recommended L2C technology and to recalculate energy	2. M&E to update energy model to account for any changes in the design or assumptions behind it and reject substitutions and omissions if achieving performance target may be compromised by the changes. 3. PM to engage with the supply chain regarding the design targets of the project and where possible provide toolbox tails to help upstill contractors and to communicate the importance of quality construction. 4. PM and M&E to input ensure the contractor has quality monitoring processes in place to ensure proper installation.	 PM, M&E and Contractor to review final construction including rectification work, for quality and performance of the LZC. IM&E to finalise as-built energy model to account for any changes in the design or assumptions behind it. Contractor to ensure the building user is trained 	patterns. Ensure a dual focus of improving accuracy of targets as well as improving building operation. 2. FM to ensure hourly energy consumption	Intentionally left blank	√		
COBACK	arbon reduction	~	V	√ √	1. PM identify a net zero carbon champion. 2. PM identify Carbon reduction options within the CoLC Guides.	 PM set clear intent for zero carbon targets and define what this includes, document boundaries and targets. 	 M&E to implement the most significant carbon/energy reduction measures in design including demand response and energy storage opportunities. PM to highligh the roles and opportunities for overcoming performance gap, for example by following the BSRIA Soft Landings Framework. 	1. M&E and PM assess low carbon alternatives to the baseline. 2. PM agree a carbon reduction target – either percentage or absolute.	are still being achieved.	 M&E to update energy model to account for any changes in the design or assumptions behind it and reject substitutions and omissions if achieving performance target may be compromised by the changes. Contractor achieve the agreed carbon reduction targets. Contractor report as-built embodied carbon on a quarterly basis. 	fully completed and witnessed and that the 'as installed' controls strategies, setpoints, commissioned flow rates, metering etc. are in line with the energy model.	 patterns. Ensure a dual focus of improving accuracy of targets as well as improving building operation. 2. FM to ensure hourly energy consumption trends match operating hours. 3. FM to upload total energy and heating energy consumption data to a public data platform for first 5 years post-completion. 4. PM report lessons learned, good practice to 	Intentionally left blank	J J	4	
e odrach	inergy Efficiency	V	V	× ×	 PM identify project team responsibilities to achieve operational energy use targets: Calculation of operational targets Documenting assumptions behind these Manging risks Validating in-use performance. PM consider contractual incentives for achievement of performance targets. SPM identify project team member who can advise on demand response. 	1. PM set energy use intensity target and embed in brief 2. M&E to discuss localised energy constraint issues with DNO 3. M&E to identify likely eligible demand response programmes at national an regional scale	M&E to establish clear energy use targets, document targets and strategies to achieve this and share with stakeholders. Develop concept design in line with ortical design parameter recommendations. Aspects to consider include: Building orientation, Facade glazing ratio, Facade glazing ratio, Coccupancy patterns and operating scenarios, Technical systems integration. M&E to develop preliminary operational energy model aligned with energy use internsity targets to guide throughout this stage. M&E to indevelop preliminary operational energy model aligned with energy use internsity targets to guide throughout this stage. M&E to implement most significant cathologies the stage opportunities. End to help in the stage opportunities. End to highling troles and opportunities for overcoming performance gap. 7. M&E to complete a passive design analysis.	energy model. 3. M&E to update and document detailed targets and strategies to achieve these. Include design measures and assumptions of likely occupancy patterns and operating scenarios as well as strategies for long term adaptability. 4. M&E to ensure proposed construction details are robust to support low energy and aritightness	and complete detail design, ensuing good continuity of insulation and arightness. 3. M&E to check the suitability of the heating and hot water system using the LET Hurne of Heat Decision Tree. Confirm HVAC systems type and performance specification. 4. M&E to iterate demand response model with exact design data to goin a more accurate prediction of carbon savings and monetary gains. Ensure that specified equipment carbon integrate fully to carry out demand response processes and events. 5. M&E to ensure specified metering is incorporated. 6. Include operational energy targets in the construction tender package. 9. M&E and PM to incorporate in contractors' prelims with guarantees to reacclude energy model if items in the register are changed or value engineered, to demonstrate that 'as built project meets agreed operational largets.	compromised. 3. PM to engage with supply chain regarding the design targets of the project and where possible provide toolbox tarks to help upskil contractors and to communicate importance of quality construction. 4. PM and M&E to ensure contractors understand commissioning nequirements, including metering commissioning and validation of manual vs half hourly readings. 5. PM to ensure the contractor has quality monitoring processes in place to ensure proper installation of insulation aritightness layer and mechanical equipment for the whole of the construction period. 6. Contractor to carry out benchmark inspections to clarify quality expectations and continue to monitor construction quality, including in-situ themat performance tests, thermographic and ari tightness testing. 7. PM and M&E to ensure the contractor understands	 Index that Costination immised accurate religy model to account for any changes in the design or assumptions. Contractor ensure commissioning and testing is fully completed and witnessed and that the 'as installed' controls strategies, septoints, commissioned flow rates, metering etc. are in line with the energy model. Contractor ensure the building user is trained an understands use of the building systems. Contractor correctly as part of the commissioning process and initial setup parameter 	1. FM - for the first year of occupation both the building and the targets should be tuned to actual building usage patterns. Ensure a dual focus of improving accuracy of targets as well as improving building operation. 2. FM ensure hourly energy consumption trends match operating hours. 3. FM ensure the metering system is operating correctly and is regularly validated against utility meters. 4. Fm identify and track key efficiency metrics. Aim to track the fewest but most useful metrics. 5. FM assign an annual budget for monitoring energy use and tuning controls in response. Alm for monthy review and quarterly 'deep dive' analysis. 6. FM line up energy efficiency assessments with post occupancy evaluation assessments to ensure occupant satisfaction with conditions in the building. 7. FM upload total energy and heating energy consumption data to a public data platform for		4		
'n	finimise Pollution	~	V	√ √	1. PM instruct specialist to carry out a contaminated land analysis, consider remediation options where there is a high degree of contamination. 2. PM instruct consultant to create a transport plan.	 PM: Flood and surface water management – an appropriate consultant is appointed to carry out and demonstrate the developments compliance with BREEAM criteria. PM: Site specific flood risk assessment taking into consideration current an future sources of flooding. PM: All water pollution prevention systems to be designed in accordance with SuDe manual and other industry best practice. PM: Refer to the contamination report and carry out remediation on the lanc where necessary. 	 PM use the LETI Future of Heat Decision Tree when making decisions on heating systems based on avoiding emitting noise, air and heat pollution. PM with M&E - avoiding or reducing the impact of night time light pollution. Through careful design and specification of light sources (BREEAM Pol 04) PM with acoustican - BREEAM Pol 05 – reduction of noise pollution – avoiding or reducing the impact of external noise from the building developed. PM Instruct all water pollution prevention systems to be designed in accordance with SuDs manual and other industry best practice. PM one at the design stage of assessment, where noise- sensitive areas or buildings are present, compliance can be demonstrated through the use of acousticians' calculations or by scale model investigations. 	prevention and separator systems.	1.PM with design team Implement the transport plan measures. 2.PM with SuDS consultant ensure compliance with the SuDS strategy.	1.M&E check compliance with the lighting strategy in line with the Guide's requirements. 2.PM review contractor's compliance with the Guide's requirements to minimise pollutions. 3.Contractor ensure SUDS manual are available for all building users.	1.Contractor provide training on all building systems.	1. FM record and test according to Local Air Quality and POE subcategories Report lessons learned, good practice to the CoLC.	Intentionally left blank	J		
,	finimise carbon	~	V	J J	 PM identify a net zero carbon champion within design team or external consultant. PM discuss whole life carbon ambitions with client. 	 PM set clear intent for GHG emission targets and define what this includes, document boundaries and targets. Vi&E establish heating and hor water target, which aligns with this Design Standard recommendations, and embed within the brief. 	M&E and Architect to consider use of low and zero carbon (LZC) technologies to minimise energy purchases and carbon emissions. Consider: Building Integrated photovoltaic and solar hot water panels. Ground, water and air source heat pumps and opportunities for heat recovery. • Heat and electricity storage, to improve load management and demands on mains supplies. • Local opportunities for wind and water power and for community systems.	details are robust to support low energy and airtightness performance characteristics. 2. Carbon consulatant produce whole life carbon	e.g. using a Design for Performance type of target and feedback loop and the performance type of target and feedback loop and the register are changed or value engineered, to demonstrate that as built project meets agreed operational targets. Create risk register and confirm responsibility for managing this during construction and commissioning.	2. PM engage with the supply chain regarding the design targets of the project and where possible provide toolbox talks to help upskill contractors and to communicate the importance of quality construction. 3. Contractor carry out benchmark inspections to clarify quality expectations and continue to monitor construction quality, including in-shult thermal performance tests, thermographic and air tightness testing. 4. PM ensure the contractor understands the commissionin	 PM, M&E and Contractor review final construction including rectification work, for quality including in-situ thermal performance tests, thermographic and air tightness testing. Contractor ensure the building user is trained understands use of the building systems. Contractor confirm the final carbon related data to the LCA specialist. 	FM - Ensure hourly energy consumption trends match operating hours.		J J	~	



Topics	A	pplicabi	ility		Strategic definition, preparation and brief	Concept design	Developed design	Technical design	Construction	Handover and close out	In Use	Considerations	Interde	ependencies
		Value		Gateway 1	Gateway 2	Gateway 3	Gateway 4	Gateway 4	Gateway 5	Gateway 6	None			CoLC
				RIBA 0	RIBA 1	RIBA 2		RIBA 4	RIBA 5		RIBA 7	Stakeholders involved / instructed		
				1	√	1	1	1	1	1	1	Project Management		(i)
				<u> </u>	<u>√</u>							Client Senior Responsible Owner Building Surveying		lienc
Categories	250k	£5m	E5m	, V	√ √	4	1	1	1	1	√	Quantity Surveying Architectural		(resi
	łow £	50k -	bove		√ √	√ √	√ √			√ √		Structural and Civil Engineering		lling
	ę	53 E3			4	1	1	1	√	√		Mechanical & Electrical Engineering Fire Engineering	5	Aode
						·	·	√	√	√	√	Interior Design Services	Carb	and 1
					√	√		1				PassivHaus Design Transportation	Life (e Imp
												Contractor	hole	ircula ocurr
								√	√	√	√		≚ ≥	
Circular		J J		. PM review of relevant Post Occupancy Evaluation eedback from previous projects.	Design team to conduct a study to explore decommissioning options: a assessing an existing building to decide if if can be refurbished radigated to meet the project objectives to inform the general approach to project delivery. b.Pt. Decommissioning or e-visiting building, followed by provision of considerations (/ design guidance to facilitate the future decommissioning of the new building. The study should consider the following as a minimum: Accessibility (see Functional adaptation strategy study). "Durability: use materials which require less frequent maintenance, repair or replacement, considering them within the context of the life span of the involves apportunities to optimes material and product russ. Welded connections prohibit disassembly and its pretenable to use screws and botts tallow for disassembly and a lis pretenable to use screws and botts tallow for disassembly and a lis generations is fassible, especially when different components have different life spans and conditionation throughout the study are no longer reusable or conditionation and upstate russ. Any during systems and conditionation and upstate russ and upstates. Some finishes can contaminate the substate in a way that they are no longer reusable or conditionation can accommodate russ and upstates such as dimensions, components, comections and modularity, 2. Plk instruct demolition contractor to carry out a pre-demolition audit where necessary.	1. PM - the design to allow for functional adaptation. 2. Pre-demolition audit to consider circular economy principles. PM to set re-use and recycle targets.	1- The design team to review the functional adaptation measures, to ensure they can be implemented. 2. PM with design team identify Circular Economy opportunities / evaluate / integrate into design where appropriate.	 Design team - functional adaptation implementation will be specific to the building and scope of the project, buil information should be made available to the assessor -Options for multiple building uses and area functions based on design details, e.g. modulanty. -Routes and methods for major plant replacement, e.g. networks and connections have flexibility and capacity for expansion. -Accessibility for local plant and service distribution routes, e.g. detailed information on building conduits and connections infrastructure. -The potential for the building to be extended, horizontally or vertically. 2. Design tean identify Circular Economy opportunities / evaluate / integrate into design where appropriate 	 Contractor to implement and report on the re-used and recycled demoliton waste i.e. materials, sinks, window and door frames, etc. PM to ensure contractors understand requirements / use contractual obligations to establish minimum performance requirements (e.g. reuse %) / encourage bette 	1. Contractor to create a adaptability and disassembly guide for future building users.	 Contractor to train building user on asset characteristics allowing functional adaptability and disassembly. 	Intentionally left blank	J	J
Circular economy	¥	~ ~		new use for the site has been commissioned.	2. PM: Means of disassembling building are made clear within the	 Design team or sustainability advisor to complete CE targets and commitments' table in the CE statement template spreadsheet. P.M The London Plan Policy SI 7 (A) targets should be st as a minimum level of compliance for the committed target. After on-site opportunities have been exhausted, applicants should refer to the London Waste Map to consider opportunities for using local sites to manage materials and waste. PM for further info see section 4.2 in GLA CE Statement. Qs estimate Bill of Materials including calculations. For further info see section 4.7 in GLA CE Statement. Age section 4.2 in GLA CE Statement. Applicants should complete and submit a pre-redevelopment audit as supporting evidence to their CE statement. To comply with London Plan Policy SI 7(B), applicants should complete a Recycling and Waste estimate table in the CE statement template at outline and full planning application stages for module stages A to C. For further info see section 4.9 in GLA CE Statement. 	2. Applicants should set out where they are retaining and returbishing a building that might otherwise be demolished. Where adaptability is selected as a design provach, information should be submitted showing how the building can be adapted for different uses. For further info see section 2, 3, 2, 5, 4, 3 in GLA CE Statement. 3. For all applications, applicants should complete the circular economy design principles by building layer table. Multiple CC design approaches will often be needed for each building layer or element. For further info see section 4.5 in GLA CE Statement.	Statement. 2. The Bill of Materials should include assumptions on the end-of-life scenarios for each building element or material. Based on the approaches adopted and how the building and its elements have been designed to facilitate	 To comply with London Plan Policy ST 7(B), applicants should complete the actual Recycling and Waste table in the CE statement template at outline and full planning. 	full planning application stages for module stages A	learnt' tables. This should:	Intentionally left blank	J	J J
Resource efficiency	J	J J	r √ F r t	. PM: At Project Briefing (RIBA 0) – Review pportunities for reuse and retention of existing uildings, prioritising reuse. PM: Where partial or complete demolition is roposed, the materials already on-site should be eviewed for their potential retention and inclusion into reposed scheme before off-site options are onsidered.	 At Project Briefing stage (RIBA 1) – Architect shall undertake feasibility on building retention and re-use and advise whether brief can be met by using existing building. 	 At Outline options (RIBA 2) – Contractor to undertake pre- demolition / pre-refurbishment audit to identify opportunities for building re-use. This will direct which building elements need to be replaced and therefore assessed from an embodied carbon perspective. A pre-demolition contractor shall be appointed at this stage to identify opportunities for building re-use. Architect to conduct a study to explore the ease of disassembly and the functional adaptation and develop recommendations or design solution. 	Plan and review the construction waste targets. See City's Code of Practice for Deconstruction and Construction Sites 9th Edition 2019 (currently being updated). 2. Architect to review the design to ensure the correct recycled quantity for material has been specified and	t 1. Architect to provide an update on how the adaptability recommendation have been implemented.	 Architect to produce a building adaptability and disassembly guide to communicate the characteristics allowing functional adaptability and disassembly to prospective ternants. Consider incorporating a material passport. 	 Contractor to report on the final quantity of waste produces per 100m2. Contractor to report the final quantity of construction waste, diverted from Landfill and wither re-used or recycle. 	N/A	Intentionally left blank	A	J J

GO BACK





	Topics	Ap	oplicability		Strategic definition, preparation and brief	Concept design	Developed design	Technical design	Construction	Handover and close out	In Use	Considerations	Intero	lependencies	
			Value	Gateway 1	Gateway 2	Gateway 3	Gateway 4	Gateway 4	Gateway 5	Gateway 6	None			CoLC	
				RIBA 0	RIBA 1	RIBA 2	RIBA 3	RIBA 4	RIBA 5	RIBA 6	RIBA 7	Stakeholders involved / instructed			
				۲ ۲ ۲	√ √ √	ـــــــــــــــــــــــــــــــــــــ	√	√	√	√	√	Project Management Client Senior Responsible Owner Building Surveying		lience)	
	Categories	w £250k)K - £50m - £50m we £5m	√	√ √ √	√ √ 	ل ب ب	الم الم الم	√ √	ل ب ب	1	Quantity Surveying Architectural		ng (resi	
		belo	E5m Abc		√ √		√ √ √	√ √ √	√ √	√ √		Structural and Civil Engineering Mechanical & Electrical Engineering Fire Engineering	Ц	Modelli	
					4	√ 		۸ ۱	√	√	√	Interior Design Services PassivHaus Design Transportation	logies ife Carl	Econor	ment
						√		√ √	4	1	1	Contractor	Techno Whole L	Climate	Procure
GO BACK	Materia	als							·						
	.ow impact materials insulation, fabric)	√ .	v v v	 PM review opportunity for retention of existing. structure and building fabric and how the quantum of materials of the new build can be reduced. 	 PM prioritise ethical and responsible sourcing of all materials. Architect prioritise low embodied carbon and healthy materials. Architect minimise materials with high embodied energy impacts. Architect promote use of local natural materials. 	 Design team to incorporate re-used materials and design. building for disassembly to allow continued material re-use for future buildings. 	 Design team to assess design for material efficiency and to determine if all materials incorporated are necessary. Architect use material guides to optimise material specification, as well as CALC specific guides for materials (FM and Capital Build). 	specification. 2. Architect review alternative products and materials	 Contractor and architect to ensure that all construction material delivered and used on site are inline with the sustainable procurement plan and are as specified in RIBA 1 and 2. 	using as-built information to assess the material	impact material strategy over the in-use stage	Intentionally left blank		V	V
	rocurement of materials	√ ·	√ √ √	1. PM with structuresd review opportunity for retention of existing structure and building. 2. Review CoLC Procurement Code and the Responsible Procurement Policy.	1. PM put in place a sustainable procurement plan. 2. PM note requirements for ethical sourcing.	1. PM to include sustainability aims, objectives and strategic targets to guide procurement activities.	 PM or contractor to review details of procedures in place to check and verify the effective implementation o the sustainable procurement plan. 	 PM with architect analyse the environmental credentials for procurement options. PM with architec prioritise thicia and responsible sourcing of materials. PM obtain local materials and where possible, re-used / recycled materials. 	Contractor receive construction carbon data and verify th environmental credentials. Contractor to review material used to ensure that sustainable procurement plan will be adhered to.	 Contractor undertake post completion analysis using as-built information to gauge compliance with the sustainable procurement plan. 	 PM and procurement team identify the risks and opportunities of procurement against a broa- range of social, environmental and economic issues and report lessons learned to CoLC. 	Intentionally left blank		V	V
	laterial durability	√ .	J J J	N/A	N/A	 When the Design team is considering the durability of a material, they should also consider how the product can be disassembled, to allow for the future use of materials and products. PM and QS note - additional coatings for durability should be avoided, as they can reduce the recyclability of the material. 	 The design team should demonstrate that they have carefully considered the drainage mechanisms of the façade and roof. Design team - key exposed building elements have been designed and specified to limit long and short terr degradation. 	NA	N/A	1. PM with Contractor review to ensure that the design team's recommendations have been implemented.	 FM - regular maintenance is to be carried out in accordance with the manufacturers recommendations to ensure the full life span of the product. 	Intentionally left blank		V	
	fodern methods of onstruction (MMC)		1 J J		 PM instruct consultant to assess the environmental impact, for example th carbon emissions equivalent of each material/ product and process, and calculate the overall carbon footprint. 		baseline. 2. Carbon consultant assess low carbon alternatives an	Information to suppliers to collect carbon data to provide	 Contractor achieve the agreed carbon reduction targets. Contractor achieve the will be added as the set of /li>	 Contractor to confirm the final carbon related data to the LCA specialist. Contractor to issue to the client a practical completion carbon report which should align design stage carbon targets with what was achieved at the end of construction. 		Intentionally left blank	J	v	J



Topics	Арр	licability		Strategic definition, preparation and brief	Concept design	Developed design	Technical design	Construction	Handover and close out	In Use	Considerations	Inte	terdependencies
	```	/alue	Gateway 1	Gateway 2	Gateway 3	Gateway 4	Gateway 4	Gateway 5	Gateway 6	None			CoLC
			RIBA 0	RIBA 1	RIBA 2	RIBA 3	RIBA 4	RIBA 5	RIBA 6	RIBA 7	Stakeholders involved / instructed		
Categories	250k E5m	50m 25m	√ √ √ √		۷ ۷ ۷	J J	4	۷ ۷	4 	√ 	Project Management Client Senior Responsible Owner Building Surveying Quantity Surveying		(resilience)
	below £2 £250k - :	E5m - E! Above f			√ √ √ √	J J J J				√	Architectural Structural and Civil Engineering Mechanical & Electrical Engineering Fire Engineering Interior Design Services	s Carbon	act Modelling nomy
				√	√ √	۸ ۸	√				PassivHaus Design Transportation Contractor	schnologie hole Life (	limate Imp ircular Ecc
Resilien	100						√	٦	√	√		≚ ≥	0 0
Kesilion		×	<ol> <li>PM instruct consultant to carry out a microclimatic simulation or study to show the effect of urban morphology on the external microclimate of the development and surrounding area.</li> </ol>	<ol> <li>Consultant develop intervention measures for assets based on the actions taken at stage 0 to mitigate the identified impact of climate change.</li> <li>Consultant asses available Heat Stress, Pluvial and Fluvial Flood data, bot current and forecast, and understand the possible impact on the site. This will use the GIS hosted platform to show assets with their anticipated exposure to climate impacts and the recommendend mitigation measures being developed as part of the climate impact modelling workstream.</li> </ol>	surveys and misotic development drawings, and develop a misot building analysis to inform the architectural concept. 4. M&E develop the concept design in accordance with critical design parameter recommendations for overheating in the LETT quide. Specific spector the consider for overheating at this chaos.	structure, fabric, building service and other installations. 2. M&E ensure that the risk of overheating has been assessed and mitigated. Conduct detailed HVAC	subcontractors' and conservators' information including final specifications, embedding conservation strategy. 4. Architect confirm envelope specification and complete detail design, ensuring good continuity of insulation and airtightness.	3. PM ensure the contractor has quality monitoring processes in place to ensure proper installation of insulatio airlightness layer and mechanical equipment for the whole of the construction period. 4. Contractor carry out benchmark inspections to clarify	<ol> <li>Contractor implement any requirements for protecting the historic or sensitive building fabric during any seasonal commissioning.</li> <li>PM with contractor review final construction , including rectification work, for quality, including jun- situ thermal performance tests, thermographic and air tightness testing.</li> <li>PM to undertake post completion analysis using</li> </ol>	<ol> <li>2. FM carry out ongoing quadrennial inspections as required.</li> <li>3. FM carry out regular maintenance of building</li> </ol>	Intentionally left blank	J	J
Biodiversity, ecology and conservation	√ √	√ √	<ol> <li>Ecologist begin initial Site Appraisals including Investigations and research, to identify significance, sensitivity, and conservation-related project risks (e.g., protected wildlife, materials containing lead and asbestog) which may affect the delivery of Client Requirements.</li> <li>Ecologist define whether any specialist conservation expertise is needed in the client team.</li> </ol>	<ol> <li>Ecologist undertake specialist Site Surveys and appraisal of conservation area or opportunity for biodiversity net gain.</li> <li>Ecologist identify specialist conservation, biodiversity and ecology Project Stakeholder interest and any future surveys necessary. Undertake consultatio and respond to feedback in Project Brief.</li> <li>Ecologist to Feasballity Studies to test the Client Requirements in relation to biodiversity, ecology and conservation, add discuss options with relevant stakeholders.</li> <li>PM and Ecologist assess the impact of the project on significance and draft a statement of significance to inform Quality Aspirations, Project Brief, Procurement Strategy and Design Programme.</li> <li>Ecologist and PM identify conservation, ecology and biodiversity knowledge, skills and experience required in the design team and include within Responsibility Matrix.</li> <li>Ecologist at a site survey and evaluation completed along with site-wide outcomes looking at the risks and opportunities with the site.</li> <li>Design or client decision confirmed for site selection surrounding previously occupied land.</li> </ol>	<ol> <li>PM with Ecologist - the Risks and opportunities of the site should be fully identified via the surveys and evaluation carried o within the preparation and brief stage. Any changes to the design based on introducing more surveys &amp; evaluations to determine si wide outcomes will be costly at this stage.</li> <li>Ecologist - further planning to avoid and manage negative ecological impacts on site is carried out early enough to influence the concept design stage and design brief. The negative impacts are managed according to the mitigation hierarchy and no overal loss of ecological value has occurred.</li> </ol>	n 10 N/A 10	1. PM prepare and coordinate specialist subcontractors' and conservators' information including final specifications, embedding conservation strategy, biodiversity strategy and ecology management plan (where appropriate).	1. Contractor with ecologist update conservation management plan.	N/A	1. Contractor complete obligations under protected species licenses (e.g., bat license).	Intentionally left blank		¥
Flood resilience	~	J J	N/A	<ol> <li>Consultant conduct a systematic risk assessment to identify the impact of expected extreme weather conditions arising from elimate change on the building over its projected life cycle. The assessment covers the installation of building services and nenweable systems, as well as structural and fabric resilience aspects and includes:</li> <li>Flood and surface water management – an appropriate consultant is appointed to carry out and demonstrate the developments compliance with BREEAM orithmia.</li> <li>Site specific bod risk assessment taking into consideration current and future sources of flooding.</li> <li>All water pollution prevention systems to be designed in accordance with SuDs manual and other industry best practice.</li> </ol>	must are account on the special case requirements and naturation man-made environment of and surrounding the site. The priority levels detailed in the Methodology must be followed, with justification griven by the appropriate consultant where water is allowed to leave the site All water collivion prevancing natures to be decined in	r 1. Architect to confirm design specifications and complete detailed design in line with guidelines stated is the requirements.	<ol> <li>Contractor to ensure relevant maintenance agreement for the ownership, long term operation and maintenance of all specified Sustainable Drainage Systems (SuDS) as in place.</li> <li>Design team to provide an update during Technical Design demonstrating how the recommendations or solutions proposed a IConcept Design have been implemented where practical and cost effective.</li> </ol>		<ol> <li>Design team to review and investigate the completed building site to ensure compliance with the design.</li> <li>Any deviation is reported and justified.</li> </ol>	1. FM - SuDS and other infrastructures are regularly maintained. 2. Appointed consultant complete flood risk assessment to understand the level of flooding and surface water run offs.	Intentionally left blank		J
Local air quailty	J J	- J J	1. Consultant create a transport plan	1. M&E / consultant to identify whether the site is within a local authority air quality management area.     2. PM instruct and ensure an Air Quality Impact Assessments is provided as applicable.     3. PM review with consultant / M&E on whether to conduct an Environmental Impact Assessment Screening Matrix checklist surrounding the possible impacts of the proposed development to air pollution.	<ol> <li>PM appoint Transport consultant to undertake a site-specific transport assessment (or develop a travel statement) and draft travel plan, which can demonstrably be used to influence the site layout and built form</li> <li>Following a transport assessment (in accordance with the requirements set out in criteria, and develop a site-specific travel plan that provides a long term management strategy which encourages more sustainable travel.</li> <li>PM and M&amp;E use the LETI Future of Heat Decision Tree when making decisions on heating systems based on avaiding emitting air pollution.</li> </ol>	<ol> <li>M&amp;E identify heating and hot water appliances that do not exceed that NOx, PM and carcinogenic levels identified by BREEAM.</li> <li>The design team and M&amp;E should ensure these products are included in the design.</li> <li>M&amp;E ensure all systems have a leak detection system</li> </ol>	NA	<ol> <li>Air quality consultant conduct interim air quality inspections to identify if the measures in place to minimise pollution from travel, and HVAC systems are working correctly.</li> </ol>	N/A	<ol> <li>Air quality consultant complete post- construction testing and inspection of local air quality.</li> <li>Air quality consultant undertake an annual assessment of air quality to ensure levels of nitrogen dioxide in 80% of the Square MIA mede health-based Limit Values and WHO Guidelines by 2025.</li> </ol>	Intentionally left blank	JJ	
Passive design	√ √	· 4 4	effect of urban morphology on the external	<ol> <li>PM with consultant / MEP evaluate site information to date and design to minimise the adverse conditions including negative microclimatic factors.</li> <li>Architect produce measured and condition surveys and historic development drawings, and develop a historic building analysis to inform the analysis of the installation, energy efficient systems green roo and unlike.</li> <li>Architect and MEP design out heat by reviewing building design, waste heat and including green and blue infrastructure into the design.</li> </ol>	1. PM with Architect develop in accordance with critical design parameter recommendations in this guide. Specific aspects to consider at this stage include. -Paulding from factor -Pacade glazing ratio -Having the factor -Pacade glazing ratio -Ikely occupancy patterns and operating scenarios -Technical systems integration 2. MAE use the LETI Future of Heat Decision Tree when making decisions on heating and hot water systems. 3. MAE with PM implement the most significant carbon/energy reduction measures in design including demand response and energy storage opportunities.	<ol> <li>M&amp;E ensure proposed construction details are robus to support low energy and airtightness performance characteristics.</li> <li>M&amp;E ensure that the risk of overheating and heat</li> </ol>	1. Architect confirm envelope specification and complete detail design, ensuring good continuity of insulation and airtightness.	<ol> <li>PM ensure the contractor has quality monitoring processes in place to ensure proper installation of insulation all glithous layer and modulancial equipment for the whole 2. Contractor carry out benchmark inspections to clarify quality expectations and continue to monitor construction quality, including in-situ themal performance tests, thermographic and ait lightness testing.</li> <li>PM to engage with contractors to ensure that the greenery is protected during construction.</li> </ol>		<ol> <li>FM ensure commissioning and testing is fully completed and witnessed and that the 'as installed' controls strategies, stepoints, commissioned flow rates, metering etc. are in line with the energy model.</li> <li>Contractor and FM ensure the building user is trained and understands use of the building systems.</li> </ol>	Intentionally left blank	V	¥



Topics		Applicabilit		Strategic definition, preparation and brief	Concept design	Developed design	Technical design	Construction	Handover and close out	In Use	Considerations	Int	erdependencies
		Value	Gateway 1	Gateway 2	Gateway 3	Gateway 4	Gateway 4	Gateway 5	Gateway 6	None			CoLC
			RIBA 0	RIBA 1	RIBA 2	RIBA 3	RIBA 4	RIBA 5	RIBA 6	RIBA 7	Stakeholders involved / instructed		
					1	1	√	√	√	1	Project Management Client Senior Responsible Owner Building Surveying		lience)
Categories	£250k	- £5m £50m	₩ ₩ ₩	л И			۸ ۸	4	√ √	√	Quantity Surveying Architectural		g (resi
	elow	250k 25m -	Above	4				J			Structural and Civil Engineering Mechanical & Electrical Engineering		lelling
	1	9 4			√ √	√ √	√ √		√ 		Fire Engineering	rbon	t Mod
				√	√	1	√		√	√	Interior Design Services PassivHaus Design	gies fe Ca	mpac
					√	√	√				Transportation	hnold ble Li	nate I ular E
۱							1	1	1	1	Contractor	Tec	Circ
s Wel													
Community centric appro	oach √	J J	<ol> <li>PM identify and understand final occupants' need to help establish appropriate health and wellbeing metrics.</li> <li>Designer consider connection to external spaces occupancy, daylight and thermal comfort, air quality (including healthy materials), user needs and operational energy when selecting the site or developing the Project Eriferi.</li> <li>PM identify opportunities to enhance existing soc and community structures through the development including place making, community involvement, amenity and opportunities for meanwhile use in the developing design.</li> </ol>	<ol> <li>PM and MEP linclude requirements for internal environmental conditions, including thermal comfort and overheating, visual and acoustic confrct, spatial needs, ventilation type, control strategies and reliationships to external environments in the design pack</li> <li>Architect consider place making, privacy, social interaction, mixed use places, community, amenity, involvement and inclusion and community consultation</li> <li>PM include outcome targets for social value in the Project Brief.</li> <li>PM include outcome targets for social value in the Project Brief.</li> </ol>		<ol> <li>PM coordinate proposals to deliver Sustainability Outcomes for health and wellbeing including daylighting, indicaria quality (nucluding healthy) materials), responsive controls and visual, thermal and acoustic confront.</li> <li>Mate consider the artificial lighting and daylighting strategy. Review environmental controls, ensuing that they are simple and initiative and supportive of the wide Sustainability Strategy and Sustainability Outcomes.</li> <li>PM encourage active circulation and travel.</li> <li>PM coordinate proposals to deliver Sustainability Outcomes for social and economic aims, including place making, privacy, social interaction, safety, mixed use places, community involvement, inclusion and amenity and opportunities for meanwhile use in to the developing design</li> </ol>	Indoor air quality (through healthy materials and other means), responsive controls and visual, thermal and acoustic comfort. 2. M&E develop the Building Manual, illustrating user interaction with the building. 3. PM Integrates social and economic aims into the technical design, including outcomes for place making, privacy, social interaction, safety, mixed use places, community involvement, inclusion and amenty, and opportunities for meanwhile use	<ol> <li>1. Pm with contractor check that quality and installation are in line with Sustainability Outcomes for health and wellbeing, inclusivity and accessibility.</li> <li>2. M&amp;E with contractor include visual, acoustic and therma confront measures. Verify location, type and function of controls and M&amp;E installations.</li> <li>3. PM check the sustainable communities strategy is delivered on site, including place making, privacy, social interaction, safely, mixed use places, community involvement, inclusion and amenity.</li> <li>4. Developer' contractor to review the construction impact</li> </ol>	Contracot support the assessment of Sustainability Outcomes for wellbeing, including assisting with user training and dissemination of the Building Manual.     Contractor support the assessment of Sustainability Outcomes for social value. Ensure aspects of place antifying, space for social interaction, inclusion, etc. are in place.	<ol> <li>FM gather occupant feedback data to measure subjective aspects. Monitoring equipment used for quantitative metrics, such as daylight.</li> <li>FM gather POE data to test the social value performance. The Social Value Tookkit or similar can be used to quantify efficacy of measures.</li> </ol>	Intentionally left blank	√	J
WELL type requirements (noise, air quality, accessibility, etc.)		J J	<ol> <li>PM and Architect identify Project Outcomes and Client Requirements in relation to inclusive design.</li> <li>PM instruct architect Consultant to undertake an access and inclusion audit of the existing site or environment to identify any Project Risks which may affect the delivery of the Client Requirements for inclusive design.</li> <li>PM instruct consultant to identify relevant current and emerging global, european, national and local inclusive design-related trends, policy and legislation 4. PM inview testback from pervices projects.</li> <li>PM define whether specialist inclusive design expertise is needed in the client team.</li> </ol>	1. PM and Architect identify inclusive design needs from stakeholders, consultation groups, site audits, design standards and legislative obligations, and include in Design Brief.     2. PM source alte information including site surveys relevant to inclusive design.     3.PM work with architect / consultant to use feasibility studies to writy that inclusive design needs and be accommodated within the project budget.	accessibility needs. 2. Architect incorporate inclusive design concept into architectural concept and outline specification, and strategic engineering's requirements. 3. PM to include a record of key inclusive design decisions in stage report.	regulations and the Equality Act. 2. PM and architect undertake design studies and engineering analysis to test and develop indusive design requirements in more detail with input from project stakeholders. 3. Architect Integrate inclusive design considerations into a specially coordinated design aligned to stakeholder consultation feedback.	<ol> <li>Design team undertake technical design, including final specifications, to manufacture and construct inclusive building.</li> <li>PM coordinate design team and specialist subcontractors' manufacturing information, construction information, and final specifications, embedding the inclusive design requirements and other project strategies.</li> <li>PM include inclusive design requirements in tender information or employed's negutirements and releve tendr returns or contractors.</li> <li>PM and and theic address the Equality Act and Building Regulations applications.</li> </ol>	commission inclusive design measures, intertiming operatives of the importance of proper workmanship and regularly inspecting the construction quality. 2. Contractor resolve inclusive design site queries 3. Contractor prepare appropriate access information for er users and occupiers for inclusion in the building manual.	<ol> <li>Contractor hand over inclusive design informatio in the building manual to the client including the inclusive design principles and measures.</li> <li>PM and contractor review project performance against learn lessons from feedback gathered on design and construction to meet the needs of all building users.</li> <li>Contractor provide induction and training for building users and facilities management team with reference to inclusive building strategy, including disability awareness and access auditing.</li> <li>Contractor close out any new relevant defects that arise during this period.</li> <li>Orticator identicates team ordertake light touch 50 Chronicity and interesting user needs.</li> <li>Child regards necessary site inspections, air quality lest, and noise level measured according to PM plan of WELL work in Stage 2.</li> </ol>	<ol> <li>PM / FM implement management and maintenance of building in a way that meet the needs of all building users.</li> <li>PM / FM leafulty and implement any adjustments or improvements required to the building, diry-loady operations or policies to meet the needs of all building users.</li> <li>Consultant underside PCO of inclusive</li> </ol>	Intentionally left blank	4	



Topics	Applicability		Strategic definition, preparation and brief	Concept design	Developed design	Technical design	Construction	Handover and close out	In Use	Considerations	Interdependencies
	Value	Gateway 1	Gateway 2	Gateway 3	Gateway 4	Gateway 4	Gateway 5	Gateway 6	None		CoLC
		RIBA 0	RIBA 1	RIBA 2	RIBA 3	RIBA 4	RIBA 5	RIBA 6	RIBA 7	Stakeholders involved / instructed	
		ـــــــــــــــــــــــــــــــــــــ		۸ ۲	✓ 	J	1	✓ 	J	Project Management Client Senior Responsible Owner Building Surveying	ilience)
Categories	łow £250k 50k - £5m m - £50m	√ √	√ √ √	√ √ √	√ √ √	√ √ √	√ √ √	√ √ √	<i>↓</i>	Quantity Surveying Architectural Structural and Civil Engineering	Illing (res
	be E5	<	√	√ √	√ √	√ √ √	√ √	√ 		Mechanical & Electrical Engineering Fire Engineering Interior Design Services	s arbon act Mode nomy
			√	4 4	√ √ √	√				PassivHaus Design Transportation Contractor	hnologie ole Life C nate Impu ular Eco
Post Occupancy	Evaluation (POE)										
Energy and Water Monitorin	ng 🗸 🗸 🗸	√ N/A	<ol> <li>PM ensure incorporation of data disclosure into BIM requirements.</li> <li>MAE to establish measurable targets for environmental performance, amenity and comfort in the project brief.</li> </ol>	1. M&E to use the LETI Future of Heat Decision Tree when making decisions on heating and hot water systems. 2. M&E to highligh the roles and opportunities for overcoming performance gap, for example by following the BSRIA Soft Landings Framework.	1. M&E develop sub-metering strategy using LETI energy disclosure guidance. Heating and cooling energy consumption (Why) should be metered separately to enable fabric performance to be assessed. 2. M&E to establish a secure remote source for metered data to be transmitted over a communications network for aggregation and storage, including operational carbon, future of heat, demand response and data.	water system using the LETI Future of Heat Decision	1. PM ensure the contractors understand commissioning requirements, including metering commissioning and validation of manual vs. half hourly readings.	1. Contractor ensure that performance data from sensors and meters are reconciled with main meters spot meter and BMS readings and that logs are up in BMS to facilitate long term monitoring of building performance.	guidance.	Intentionally left blank	х



4		rements Sub-category	Performance requirements Performance standards and specifications from industry standards, regulations and guidance to set the CoL Standard	New build Returb	Listed Component replacement only	Residential Commercial (e.g., Offices)	Public (e.g., Schools) below £250k	m053 - m25 Above £50m Altre	Technologies Whole Life Carbon Climate Impact Modelling (resilience Clicular Economy Procurement	eouaraian Pingo Wd PM Guide (Projec Task Bar	uggiosogo yset epino Md ct Delivery Methodology) PPG Activities	Project Management Building Surveying Quantity Surveying	Architectural Structural and Civil Engineering Mechanical & Electrical Engineering	Fire Engineering Interior Design Services PassivHaus Design Transportation Contractor
			Introduction and Accreditation	ons										
			1. As a minimum, achieve an Outstanding rating and final certificate (≥85% including mandatory credits) for new build.	_						DT Appointments	Prepare a list of primary and secondary Consultants.			
GO BACK		BREEAM	2. As a minimum, achieve an Excellent rating and final certificate (270% including mandatory credits) for refurbishments / fit outs / Listed Buildings.	J J	~	J J	~	J J J		Practical Completion	To complete and review the Schedule of services and scope of works reflects the Project requirements.	J J J	· J J	J J J J
	Sustainability rating	SKA	1. As a minimum, achieve Gold label in self assessment.	~		~		J J J		DT Appointments Practical Completion	Project closure report Prepare a list of primary and secondary Consultants. To complete and review the Schedule of services and scope of works reflects the Project requirements.		· • •	J J J J
	(use most current and appropriate scheme) - assess the building using at least one of the schemes listed here.	NABERS UK	1. As a minimum achieve 5 stars (Excellent) for Design for Performance and Energy for Offices rating.	~		4		J J J	N/A	DT Appointments Practical Completion	Project closure report Prepare a list of primary and secondary Consultants. To complete and review the Schedule of services and scope of works reflects the Project requirements. Project closure report	J J J J	· • •	4 4 4
		Home Quality Mark (HQM)	1. As a minimum, achieve a 4 star rating and at least a score of 3 in each of the 3 Indicators of Performance (my cost, my wellbeing, my footprint), as well as all minimum requirements.	√		~		J J J		DT Appointments Practical Completion	Prepare a list of primary and secondary Consultants. To complete and review the Schedule of services and scope of works reflects the Project requirements. Project closure report	✓ ✓ ✓	~ ~ ~	✓ ✓ ✓ ✓



				New build	Refurb Listed	Component replacement only	Residential	Commencial (e.g., Schools) Public (e.g., Schools)	below £250k £250k - £5m	£5m - £50m	Tachnologias	Whole Life Carbon	Climate Impact Modelling (resilier	Circular Economy	Procurement	PM Guide Reference	PM Guide Task Description	Project Management Building Surveying	Quantity Surveying	Architectural Structural and Civil Engineering	Mechanical & Electrical Engineerin	Fire Engineering Interior Design Services	PassivHaus Design Transportation
	Requi	rements	Performance requirements	A	sset typ	e	Cla	155	,	Value		Inter	depend	lencies	I	PM Guide (Project	Delivery Methodology)			Key S	stakeholde	ers	
	Category / -	Sub-category	Performance standards and specifications from industry standards, regulations and guidance to set the CoL Standard													Task Bar	PPG Activities						
			Whole Life Carbon																				
ОВАСК	Whole life cycle carbon assessment	Whole life carbon	<ol> <li>Report Whole Life Carbon in kgCO₂e/sqm in compliance with RICS Whole Life Carbon/BSI EN 15978 Standard.</li> <li>All buildings to conduct whole life carbon calculations and aim to achieve 40% carbon emission reductions.</li> <li>Review Planning Advice Note on Whole Lifecycle Carbon emission options - follow methodology. Reference where relevant Greenhouse Gas impact assessments, the Circular Economy Statement, operational energy and water assessments.</li> <li>Develop optimisation measures, costs, and a menu of the measures based on the cost of the optimisation in £/kgCQe saving.</li> </ol>	1	J J	~	√ ,	/ √	J J	′√、		· √		~	F	easibility / Initial Surveys	Approve the Primary Consultants Feasibility Report.	~		√			
	Embodied carbon	Embodied Carbon	<ol> <li>Less than 300 kgCO₂e/sqm up-front Embodied Carbon towards net zero by 2027 in the City Corporation's operations. RICS Whole Life Carbon (A-C)/BSI EN 15978 Standard.</li> <li>Small-scale housing to reduce embodied carbon by 40% or to &lt;500 kgCQ/m².</li> <li>Medium- large scale housing to reduce embodied carbon by 40% or to &lt;500 kgCQ/m².</li> <li>Commercial offices to reduce embodied carbon by 40% or to &lt;600 kgCQ/m².</li> <li>Schools to reduce embodied carbon by 40% or to &lt;600 kgCQ/m².</li> <li>Schools to reduce embodied carbon by 40% or to &lt;600 kgCQ/m².</li> <li>By December 2023 whole-life carbon assessments for buildings above a gross internal area of 1000n² or which create more than 10 dwellings must be carried out.</li> <li>By 2030 all new buildings to achieve a 65% reduction in embodied carbon emissions against baseline of 800kgCQ/m² for domestic assets and 1000 kgCO₂/m² for non-domestic.</li> <li>Upfront embodied carbon emissions should be verified post-construction.</li> <li>Consider Future Homes Standard - Low carbon heating, energy efficiency homes for 75-80% lower carbon emission.</li> </ol>		JJ	V	J ,	/ √	v v	∕√ √	/ v	√			C	T Appointments	QF170 Mechanical and Electrical Engineer's Services ScopeArrange a Kick-Off meeting with Primary Consultants.	J			V		
		End of Life	<ol> <li>All CoLC projects are assumed to have a lifecycle of 60 years in line with RICS 2017 guidance.</li> <li>For all domestic and non-domestic assets 50% of materials should be from re-used sources.</li> <li>For all domestic and non-domestic assets 80% of materials should be able to be re-used at end of life.</li> <li>Environmental Product Declarations (EPDs) should be requested from all suppliers.</li> </ol>	√ .	√ √	~	√ ,	/ √	√ √	′√ √	/ ~			~	F	easibility / Initial Surveys	Approve the Primary Consultants Feasibility Report.	~	~	V	~		,
			1. To achieve a maximum Energy Use Intensity of 35 kWh/m ² .yr.	~	√ √		~		~	<ul><li>√ √</li></ul>	/ >										~		
			1. To achieve a maximum Energy Use Intensity of 55 kWh/m ² .yr.	~	√ √		``	/	~	<ul> <li>✓</li> </ul>	/ >						QF170 Mechanical and Electrical Engineer's				$\checkmark$		
		Energy Use Intensity (EUI)	1. To achieve a maximum Energy Use Intensity of 65 kWh/m2.yr.	~	~ ~			$\checkmark$	~	<ul> <li>✓</li> </ul>	/ ~					T Appointments	Services ScopeArrange a Kick-Off meeting with Primary Consultants.				$\checkmark$		
			*Operational energy is the energy (regulated and unregulated) consumed by a building and its occupiers. **Energy Use Intensity (EUI) in Gross Internal Area (GIA), excluding renewable energy contribution.								V										~		
		Space Heating Demand	1. All building types should be designed for and achieve the space heating demand target of less than 15 kWh/nfyr.	~	√ √		√ ,	/ √	,	: x )	K V				C	T Appointments	QF170 Mechanical and Electrical Engineer's Services ScopeArrange a Kick-Off meeting with Primary Consultants.				~		
O BACK	Operational carbon and energy and LZC Technologies	On-site energy generation	<ol> <li>Consider maximising the on-site energy generation:         <ul> <li>Residential Generate 100% of annual energy.</li> <li>Commercial (e.g. offices) Generate 2-floors requirement of annual energy.</li> <li>Public (e.g. schools) Generate 70% of annual energy.</li> </ul> </li> </ol>	1	√ √		√ ,	/ √	2	: x )	k v				F	easibility / Initial Surveys	Approve the Primary Consultants Feasibility Report.				1		
		Airtightness	1. Passivhaus airtightness (n50) ≤ 0.6 m³/h. m²@50Pa).	1	J		√ ,	/ √	2	: x :	K V						Ensure the Building Service Engineer and other specialist are in attendance to witness testing & commissioning.				V		√ ×
		LZC technologies	<ol> <li>Establish the LZC technologies appropriate and available to the building and its energy demand.</li> <li>Specify the most suitable LZC technology based on the above for the building. Where there is a peak heat demand of more than 100kW, the building must be connected to existing decentralised energy networks.</li> <li>Track and disclose the reduction in CQ emissions as result of the LZC technology.</li> <li>All new builds are 100% powered by renewable energy. Any energy not met by on-site renewables must be met by an investment into additional renewable capacity.</li> </ol>	1	√ √		√ ,	/ √	v	<ul><li>✓ 、</li></ul>	/ v				C	T Appointments	QF170 Mechanical and Electrical Engineer's Services ScopeArrange a Kick-Off meeting with Primary Consultants.	1		V	~		v .
			Net Zero 1. CoLC and Square Mile to aim for Net Zero on scope 1, 2 and 3 through compliance with Operational Energy and Carbon and LZC Technology Categories. The building emission rate (BER) expressed as carbon dioxide emissions (CO2-eq) per square metre per year (kg CO2-eq/m ² )/ear). The BER is to be calculated in accordance with the National Calculation Methodology (NCM) and the Simplified Building Energy Model (SBEM) and reported. 2. CoLC to reduce/remove at least 1050ktCQe to reach Net 0- 100% of Scope 1 & 2 and 66% of Scope 3 in line with SBTI. 3. Square Mile to reduce/remove at least 1,528ktCQe to achieve net zero in line with SBTI. 4. Between 2025-2050 there will need to be an upgrade to Zero Carbon at a rate of 3,750 homes per day.	1	J J	1	√ ,	/ √	√ √	<ul> <li>✓</li> </ul>	/	V		¥	C	T Appointments	QF170 Mechanical and Electrical Engineer's Services ScopeArrange a Kick-Off meeting with Primary Consultants.	1		1	J		√ · ·
			Technologies 1. Within the Square Mile work with other organisations to develop a Climate Action Fund to invest in effective zero carbon technologies and accelerate decarbonisation in line with the CoLC Net Zero Technical Guide.	√	√ √		,	/	√ √	<ul><li>✓ 、</li></ul>	/ >	· √		J	C	T Appointments	QF170 Mechanical and Electrical Engineer's Services ScopeArrange a Kick-Off meeting with Primary Consultants.	~		V	J		✓ ,



GOBACK

# **DESIGN GUIDE - PROJECT REQUIREMENTS**

		New build Refinb	Listed Component replacement only	Residential	Commercial (e.g., Offices) Public (e.g., Schools)	below £250k £250k - £5m	£5m - £50m Above 650m	Technologies	Whole Life Carbon	Climate Impact Modelling (resilience Circular Economy	Procurement	PM Guide Reference	PM Guide Task Description	Project Management	Building Surveying Quantity Surveying	Architectural Structural and Civil Engineering	Mechanical & Electrical Engineering Fire Engineering	Interior Design Services PassivHaus Design	Transportation Contractor
Requirements	Performance requirements	As	set type	с	ass	``	/alue		Interd	dependencies			t Delivery Methodology) PPG Activities			Key S	takeholders		
Category / Sub-category Carbon reduction	Performance standards and specifications from industry standards, regulations and guidance to set the CoL Standard      Building design      All buildings to conduct whole life carbon calculations and aim to achieve 40% carbon emission reductions.      All New buildings to be designed in accordance with the CoLC Net Zero Design and Technical Guide to achieve Net Zero.      All New buildings to achieve zero net regulated CQ ₂ -eq emissions at operation by complying with the requirements of the Net Zero t=Technical and Design Guide 2050.      A The CoLC current operation's emission to be reported and zero net regulated CQ ₂ -eq emissions is achieved by 2027, through remedial actions introduced in compliance with the CoLC's Technical and Design Guides requirements.     S. The Square Mile's CO ₂ -eq emission and net zero CO ₂ -eq emissions is achieved by 2040 through remedial actions introduced in compliance with CoLC's Technical and Design Guides requirements.     For further information regarding carbon reduction percentages and amounts, please review the embodied carbon sub-category.	√ √	<ul> <li>4</li> </ul>	~	√ √	~ ~	· v v	,	~			Task Bar DT Appointments	QF170 Mechanical and Electrical Engineer's Services ScopeArrange a Kick-Off meeting with Primary Consultants.	~		√	√	~	√
	Carbon Removals 1. Increase presence of green roofs to 65,800m ² by 2024 in the Square mile to assist in carbon absorption and storage. 2. Introduce new land management practices across CoLC open spaces aiming to maximise their ability to remove carbon. 3. If on-site carbon emission reduction is unavailable, offseting of residual CQ ₂ emissions through 'allowable solutions' for the lifetime of the building to achieve national targets for zero-carbon homes and non-domestic buildings must be investigated. 4. Where carbon targets cannot be met on-site the City Corporation will require carbon abatement elsewhere in line with the CoLC's off-setting requirements.	J J	<ul> <li>4</li> </ul>	~	√ √	J J	- v	/	~			DT Appointments	QF170 Mechanical and Electrical Engineer's Services ScopeArrange a Kick-Off meeting with Primary Consultants.	~		√	V	V	V
Energy Efficiency	Energy Performance targets 1. All new-build homes will be expected to achieve EPC C by 2035. 2. All rented non-domestic buildings will be expected to be EPC B by 2030.	J J	<i>,</i>	~	√ √	J J	- v	< √			1	DT Appointments	QF170 Mechanical and Electrical Engineer's Services ScopeArrange a Kick-Off meeting with Primary Consultants.	~		√	~	V	~
	Passive design 1. Ensure appropriate thermal comfort levels are achieved in all occupied spaces in line with relevant industry standards such as CIBSE Guide A, CIBSE TM52 CIBSE TM59. 2. Implement passive design measures to reduce the total heating, cooling, mechanical ventilation, lighting loads and energy consumption.	and 🗸 🗸	r	~	√ √	1 1	√ √	1 1			1	DT Appointments	QF170 Mechanical and Electrical Engineer's Services ScopeArrange a Kick-Off meeting with Primary Consultants.	~		√	~	~	
	Materials 1. Emissions arising from demolition, construction and transport of construction materials and waste must be monitored and reported to help reduce the impact of construction works on air quality. This must be carried out inline with Air Quality Category, Transport requirements. 2. Local reclaimed brick should be sourced wherever possible. An unfired brick system with much lower embodied carbon may be suitable for internal non-load bearing walls and can also help with humidity regulation.	V V	<i>,</i>	~	√ √	√ √	√ √	<pre>/</pre>	~	$\checkmark$	√	Feasibility / Initial Surveys	Approve the Primary Consultants Feasibility Report.			√			J
	Pollution reductions 1. All feasible and viable on-site or near-site options for carbon emission reduction must be applied before consideration of offsetting, 2. Low and zero carbon technologies must be evaluated, and non-combustion-based technologies should be prioritised. 3. All new buildings to achieve a 65% reduction in embodied carbon emissions in line with the Embodied Carbon and Energy Category. 4. All buildings to conduct whole life carbon calculations and aim to achieve 40% carbon emission reductions.	~ ~	,	~	√ √	J J	- v v	<ul> <li>1</li> </ul>	~			DT Appointments	QF170 Mechanical and Electrical Engineer's Services ScopeArrange a Kick-Off meeting with Primary Consultants.			√			~



GO BACK

		New build Refurb	Listed Component replacement only	Residential Commercial (e.g., Offices)	Public (e.g., Schools)	below £200K £250k - £5m	£5m - £50m Above £50m	Technologies	Whole Life Carbon Climate Impact Modelling (resilience Circular Economy	Procurement PM Guide Reference	PM Guide Task Description	Project Management	Building Surveying	dutariuty our veyme Architectural	Structural and Civil Engineering Mechanical & Electrical Engineering	Fire Engineering Interior Design Services	PassivHaus Design Transportation Contractor
Requirements Category / Sub-category	Performance requirements Performance standards and specifications from industry standards, regulations and guidance to set the CoL Standard	Asse	et type	Class		Val	ue		Interdependencies	PM Guide (Proj Task Bar	ect Delivery Methodology) PPG Activities			Ke	ey Stakeholo	ters	
	Light Pollution 1. BREEAM Pol 04 Reduction of night time light pollution through effective design that removes the need for external lighting or via reducing the impact by aligning with BREEAM Pol 04 requirements; • External lighting pollution has been eliminated through effective design that removes the need for external lighting. This does not adversely affect the safety and security of the site and its users. • OR alternatively, where the building does have external lighting: • The external lighting pollution has been designed in compliance with Table 2 (and its accompanying notes) of the Institution of Lighting Professionals (ILP) 2. Guidance notes for the reduction of obtrusive light, 2011. • All external lighting (except for safety and security lighting) can be automatically switched off between 23:00 and 07:00. • If safety or security lighting is provided and will be used between 23:00 and 07:00, this part of the lighting system complies with the lower levels of lighting recommended during these hours in Table 2 of the ILP guidance notes. • Illuminated advertisements are designed in compliance with ILP PLG05 The Brightness of Illuminated Advertisements.	√ √	4	√ √	√ 、	√ √	√ √	~		Feasibility / Initia Surveys	Approve the Primary	~	√ √	~	~		J
	Light Pollution 1. (Institute of Lighting Professionals ILP Guidance 2021) The ILP guidance and its accompanying notes outlines four sets of recommendations based on the design location and use of a building: 4. Limits to the average upward light ratio of the luminaires, to restrict sky glow. 4. Limiting illuminance at the windows of nearby properties for which light trespass might be an issue. 4. Limiting the intensity of each light source in potentially obtrusive directions beyond the site boundaries. 4. Limiting the average luminance of the building if it is floodlit.	n, √ √	V	√ √	√ 、	√ √	J J	st.		Feasibility / Initia Surveys	Approve the Primary Consultants Feasibility Report.	V	√ √	V		A	J
	Light Pollution 1. Limit the City's contribution to light spillage and 'sky glow' by the following measures: •Ensure that any upward light is directed at vertical surfaces rather than into the sky to minimise light pollution. •Consider retaining natural darkness as is appropriate in environmental sensitive areas. •Retail: retail frontages are often over lit and spill too much light into the environment, consider reducing light intensity of frontages during darkness.	√ √	~			√ √	√ √	~		Feasibility / Initia Surveys	Approve the Primary Consultants Feasibility Report.	~	√ √	V	1		~
	Light Pollution 1. (Bat Conservation Research Lab, University of the West of England, Bristol) Take sustainable approach to lighting whilst being functional (safety) including identifying the possible impact to local biodiversity such as bats; •Natural darkness should be retained in areas such as the river, parks, gardens and churchyards where birds, bats and other fauna and flora benefit from the observation of the circadian cycle where people are unlikely to visit during darkness. •Identify local bat species via bat surveys and identify lighting solutions to minimise the impact on local bats. Some species respond to lighting in different ways dependent on the light type, colour and habitat, some bats being attracted to artificial lights and some have an aversion. •Consider the use of LED lighting which does not generally emit insect attracting UV.	J J	J			√ √	J J	4		Feasibility / Initia Surveys	Approve the Primary Consultants Feasibility Report.	√	√ √	V	4		J
	Noise Pollution 1. Identify noise sensitive areas within 800m of development and develop a noise impact assessment compliant with BS 4142: 2014.	√ √	$\checkmark$	√ √	~ ~	√ √	√ √	~		Feasibility / Initia Surveys	Approve the Primary Consultants Feasibility Report.	$\checkmark$	√ √	~	~		~
Minimise carbon	Construction 1.A contaminated land professional undertakes a site investigation, risk assessment and appraisal, which deems that land within the development footprint to be affected by contamination. This report identifies: •The degree of contamination •The contaminant sources or types •The options for remediating sources of contamination which present an unacceptable risk. 2. The client or principal contractor confirms that a remediation strategy will be implemented, in line with the report. As per BREEAM LE01 Site Selection. 3. Ensure the Principal Contractor(s) holds a EMS/EMAS ISO14001 certificate or for BS 8555, evidence of their status, e.g. a copy of their phase 4 audit as per BREEAM Man 03. 4. Create and implement an erosion and sedimentation control plan for all construction activities alongside measures implemented to reduce pollution from construction activities.	√ √	4	√ √	√ 、	~ ~	√ √		N/A	Feasibility / Initia Surveys	Approve the Primary Consultants Feasibility Report.	√	~ ~	V	~		1
	<ul> <li>Refrigerants</li> <li>BREEAM Pol 01 impact of refrigerants;</li> <li>1. Ideally, where possible no refrigerants should be used within the plant or systems however if they are installed they should follow the BREEAM Pol 01 requirements.</li> <li>2. All systems with electric compressors comply with the requirements of BS EN 378:20161 (parts 2 and 3). Refrigeration systems containing ammonia comply with the Institute of Refrigeration Ammonia Refrigeration Systems code of practice.</li> <li>3. The direct effect life cycle CQ₂ equivalent emissions (DELC) of ≤100 CQ₂-eq/kW. For systems which provide cooling and heating, the worst performing output based on the lower of kW cooling output and kW heating output is used to complete the calculation.</li> <li>4. All refrigerants used have a global warming potential (GWP) ≤10.</li> <li>5. Systems using refrigerants have a DELC of ≤1000kgCO₂-eq/kW cooling and heating capacity.</li> </ul>	J J	4	J J	✓ 、	1 1	J J	4		DT Appointments	QF170 Mechanical and Electrical Engineer's Services ScopeArrange a Kick-Off meeting with Primary Consultants.	s.	√ √	✓ .	1 4	1	J



368			New build	Refurb	Component replacement only	Residential Commercial (e.g., Offices)	Public (e.g., Schools)	below £250k £250k - £5m	E5m - £50m Above £50m	Technologies	Whole Life Carbon Climate Impact Modelling (resilience Circular Economy	Procurement	PM Guide Reference	PM Guide Task Description	Project Management Building Surveving	Quantity Surveying	Architectural Structural and Civil Engineering	Mechanical & Electrical Engineering Fire Engineering Interior Design Services	PassivHaus Design Transportation Contractor
	Requirements	Performance requirements	A	Asset ty	ре	Clas	is	Va	ue	Ir	nterdependencies		PM Guide (Projec	t Delivery Methodology)			Key Stak	eholders	
	Category / Sub-category	Performance standards and specifications from industry standards, regulations and guidance to set the CoL Standard					-			_		_	Task Bar	PPG Activities					
		<ul> <li>I. Undertake an annual assessment of air quality to ensure levels of nitrogen dioxide in 90% of the Square Mile meet health-based Limit Values and WHO Guideline by 2025:</li> <li>The recommendation is an annual nitrogen dioxide AQG level of 10 μg/m³.</li> <li>The recommendation is a short-term (24-hour) nitrogen dioxide AQG level of 25 μg/m³.</li> </ul>		~ ~	r	1	~	√ √	√ √	~			DT Appointments	QF170 Mechanical and Electrical Engineer's Services ScopeArrange a Kick-Off meeting with Primary Consultants.	~		/	1	✓ ✓
GOBACK	Minimise pollution	Monitoring 1. Developers are required to, where appropriate provide Air Quality Impact Assessments - please refer to Air pollution sub-category - indoor air quality for guidance. 2. Water Monitoring: For water consuming building areas consuming 10% or more of the buildings total water demand, fit easily accessible sub meters or water monitoring equipment, connected to an appropriate utility monitoring and management system e.g. BEMS. 3. Water leak detection systems to be installed to detect any major leaks within the building alongside flow control devices to regulate the water supply of each WC or sanitary facility as per BREEAM Wat 02 and 03 credit requirements.		√ √	,	V	V	√ √	J J	V			DT Appointments	QF170 Mechanical and Electrical Engineer's Services ScopeArrange a Kick-Off meeting with Primary Consultants.	J		/	V	V
		Monitoring BREEAM Pol 01 Impact of Refrigerants; 1. Refrigerant Leak detection - All systems are hermetically sealed or only use environmentally benign refrigerants. Where the systems are not hermetically sealed: Systems have: - A permanent automated refrigerant leak detection system, that is robust and tested, and capable of continuously monitoring for leaks. - An inbuilt automated diagnostic procedure for detecting leakage is enabled. - In the event of a leak, the system must be capable of automatically responding and managing the remaining refrigerant charge to limit loss of refrigerant.	V	√ √	,	V	√	√ √	√ √	~			DT Appointments	QF170 Mechanical and Electrical Engineer's Services ScopeArrange a Kick-Off meeting with Primary Consultants.					
		<ul> <li>Water Pollution</li> <li>BREEAM Pol 03 Flood and surface water management;</li> <li>1. SuDs are considered by all developers in new major developments and should, where possible, provide multifunctional benefits.</li> <li>2. There is no discharge from the developed site for rainfall up to 5mm (confirmed by the appropriate consultant).</li> <li>3. Areas with a low risk source of watercourse pollution, an appropriate level of pollution prevention treatment is provided, using appropriate SuDS techniques.</li> <li>4. Areas with a high risk of contamination or spillage of substances, such as petrol and oil, have separators (or an equivalent system) are installed in surface water drainage systems.</li> <li>5. Chemical or liquid gas storage areas have a means of containment fitted to the site drainage system (i.e. shut-off valves). This is to prevent the escape of chemicals to natural watercourses in the event of a spillage or bunding failure.</li> <li>6. All water pollution prevention systems have been designed and installed in accordance with the recommendations of documents such as the SuDS manual and other relevant industry best practice. They must be bespoke solutions taking account of the specific site requirements and natural or man-made environment of and surrounding the site.</li> <li>7. A comprehensive and up to date drainage plan of the site will be made available for the building or site occupiers.</li> <li>8. Relevant maintenance agreements for the ownership, long term operation and maintenance of all specified SuDS must be in place.</li> <li>9. All external storage and delivery areas are designed and detailed in accordance with the current best practice planning guidance.</li> </ul>	V	√ √	,	J J	V	J J	JJ		N/A		DT Appointments	QF170 Mechanical and Electrical Engineer's Services ScopeArrange a Kick-Off meeting with Primary Consultants.	J J	V	/		J
		Water Pollution BREEAM Pol 03 Flood and surface water management 1. To increase the resilience and resistance of the development to flooding, and therefore reducing the risk of water pollution. 2. The ground level of the building and access to both the building and the site, are designed (or zoned) so they are at least 600 mm above the design flood level of the site's flood zone (see 600mm threshold). 3. The final design of the building and the wider site reflects the recommendations made by an appropriate consultant in accordance with the hierarchy approach outlined in section 5 of BS 8533:2017.	V	√ √	,	√ √	√	√ √	√ √		N/A		DT Appointments	QF170 Mechanical and Electrical Engineer's Services ScopeArrange a Kick-Off meeting with Primary Consultants.	√ √	V	/		J
		Water Pollution 1. Local authorities are required to approve a drainage system and its subsequent maintenance prior to construction.	V			√ √	~	√ √	√ √		N/A		DT Appointments	QF170 Mechanical and Electrical Engineer's Services ScopeArrange a Kick-Off meeting with Primary Consultants.	√ √	~	/		V
		Water Pollution 1. FOG (fats oils and greases) regulation state it is illegal to dispose of anything in a sewer that can block or ristrict flow. •Make occupants aware of legislation to reduce the risk of pollution through sharing information.	~	~ ~	<ul><li>✓</li></ul>	√ √	~	√ √	√ √		N/A		DT Appointments	QF170 Mechanical and Electrical Engineer's Services ScopeArrange a Kick-Off meeting with Primary Consultants.	√ √	$\checkmark$	/		~
		Water Pollution 1. Incorporate trees, shrubs and gardens ensure they are planted, protected, enhanced to collect and attenuate water runoff.	~	√ √	r	√ √	~	√ √	√ √		✓		DT Appointments	QF170 Mechanical and Electrical Engineer's Services ScopeArrange a Kick-Off meeting with Primary Consultants.	√ √	$\checkmark$	/		~
		<ul> <li>Air Pollution</li> <li>1. The hourly limit of 200µg/m³ Nitrogen dioxide must not be breached.</li> <li>2. Annual Average PM10 value of 20µg/m³.</li> <li>3. Development that would result in deterioration of the City's Nitrogen dioxide or PM10 pollution levels will be resisted.</li> <li>4. Annual Average PM2.5 value of 10µg/m³.</li> <li>5. Reduce emissions of NOx from large buildings by at least 3% per year.</li> <li>6. All gas boilers will be required to have a NOx rating of &lt;24mgNOx/KWh at 0% O2.</li> <li>7. Chinneys should terminate a minimum of 2m above roof height where possible. Stack discharge velocity should be at least 10m/sec. minimum.</li> <li>8. Appliances 1MW or greater will be required to achieve a stack discharge velocity of 15m/sec.</li> </ul>	~	J J	· √	J J	V	1 1	J J				DT Appointments	QF170 Mechanical and Electrical Engineer's Services ScopeArrange a Kick-Off meeting with Primary Consultants.	J J	~	/		1 1



369			New build Refurb Listed	Comportent repracement only Residential Commercial (e.g., Offices)	Public (e.g., Schools) below £250k £250k - £5m £5m - £50m Above £50m	Technologies Whole Life Carbon Climate Impact Modelling (resilience Circular Economy Procurement	PM Guide Reference PM Guide Task Description	Project Management Building Surveying Quantity Surveying Architectural Structural and Civil Engineering Mechanical & Electrical Engineering Fire Engineering Fire Engineering Interior Design Services PassivHaus Design Transportation Contractor
	Requirements	Performance requirements	Asset type	Class	Value	Interdependencies	PM Guide (Project Delivery Methodology)	Key Stakeholders
	Category / Sub-category	Performance standards and specifications from industry standards, regulations and guidance to set the CoL Standard					Task Bar PPG Activities	
GOBACK		Air pollution Monitoring & Plans 1. The City Corporation will monitor air quality to assess compliance with Air Quality Limit. 2. Nitrogen dioxide monitoring – continuous analysers will be used to monitoring Nitrogen dioxide levels, producing average hourly readings. These will be calibrated twice a year. 3. Data will also be collected from diffusion tubes across 100 locations in the square mile to compare levels to the annual mean limit value and detecting hot spots. 4. Pollutant alerts with messages for City Air Smart Phone app based on air quality data when pollutant levels are high. 5. Annual assessments of air quality to ensure levels are within the guidelines. 6. Develop a plan for reducing the air quality impact on days of high and very high air pollution. 7. Develop a logistics approach that avoids deliveries during peak congestion and pedestrian footfall times. 8. All new developments to be air quality neutral as a minimum and developments subject to an Environmental Impact Assessment to be Air Quality Positive in line with the requirements of the emerging London Plan.	J J J	~ ~	J J J J J	N/A	QF170 Mechanical and Electrical Engineer's Services ScopeArrange a Kick-Off meeting with Primary Consultants.	✓ ✓ ✓ ✓
		Air Pollution City of London Transport 1. Ensure that subject to operational requirements, 100% of vehicles owned or leased by the City Corporation are electric or hybrid by 2025. 2. Require electric or hybrid vehicles as a default for the Corporate taxi contract, together with annual emission reduction targets. 3. Require zero emission and electric or hybrid vehicles as a default for courier contracts, together with annual emission reduction targets. 4. Have an entirely zero emission fleet by 2037 at the latest.	√ √ √	1 J J	J J J J J	N/A	OF170 Mechanical and Electrical Engineer's Services ScopeArrange a Kick-Off meeting with Primary Consultants.	✓ ✓ ✓ ✓ ✓

57	



	New build	Refurb	Listed	Component replacement only	Residential	Commercial (e.g., Offices)	Public (e.g., Schools)	below £250k	£250k - £5m	£5m - £50m	Above £50m	Technologies	Whole Life Carbon	Climate Impact Modelling (resilience	Circular Economy	Procurement	PM Guide Reference	PM Guide Task Description	Project Management	Building Surveying	Quantity Surveying	Architectural	Structural and Civil Engineering	Mechanical & Electrical Engineering	Fire Engineering	Interior Design Services	PassivHaus Design	Transportation Contractor
		Asset	t type			Class	;		Va	lue			Interc	lepend	encies			ct Delivery Methodology)				к	ey Sta	akehol	Iders			
		_	_	-		_			_	_							Task Bar	PPG Activities		_	_	_	_	_	_	_	_	
used	$\checkmark$	V	~	~	~	V	~	~	~	~	~		~		~		Feasibility / Initial Surveys	Approve the Primary Consultants Feasibility Report.	~			~						~
uction or for	V	V	~	~	~	V	~	~	$\checkmark$	~	~		~		~	V	Feasibility / Initial Surveys	Approve the Primary Consultants Feasibility Report.	~			~						1
	$\checkmark$	√	√	√	√	√	$\checkmark$	~	~	√	~		V		V		Feasibility / Initial Surveys	Approve the Primary Consultants Feasibility Report.	$\checkmark$			√						V
	$\checkmark$	V	V	~	V	√	~		1	V	~		~		~		Concept Design	DT to prepare a Scheme Design report on completion	~			√	V			V		~
rom eted	~	$\checkmark$	$\checkmark$	~	~	$\checkmark$	~	~	$\checkmark$	~	~		$\checkmark$		~		Concept Design	DT to prepare a Scheme Design report on completion	√			~	~			~		~
	$\checkmark$	$\checkmark$	$\checkmark$	~	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	~		$\checkmark$		1	~	Procurement Strategy	Procurement Strategy Report	$\checkmark$			√						$\checkmark$

370				New build Refurb Listed	Component replacement only Residential	Commercial (e.g., Offices) Public (e.g., Schools)	below £250k £250k - £5m £5m - £50m	Above £50m	Technologies Whole Life Carbon Climate Impact Modelling (resilience	Circular Economy Procurement	PM Guide Reference	PM Guide Task Description	Project Management Building Surveying	Quantity Surveying Architectural Sructural and Civil Engineering	Mechanical & Electrical Engineering Fire Engineering Interior Design Services	PassivHaus Design Transportation Contractor
		rements Sub-category	Performance requirements Performance standards and specifications from industry standards, regulations and guidance to set the CoL Standard	Asset type		Class	Value		Interdepend	lencies	PM Guide (Pro	ject Delivery Methodology) PPG Activities		Key St	takeholders	
		Sub-category	Circular economy									FFG Activities				
GO BACK		Circular economy	A Circular Economy Statement should be submitted (detail proportionate to the scale of the development), to demonstrate: +How all materials arising from demolition and remediation works will be re-used and/or recycled. +How the proposal's design and construction will reduce material demands and enable building materials, components and products to be disassembled and re-used at the end of their useful life. •Opportunities for managing as much waste as possible on site. •Adequate and easily accessible storage space and collection systems to support recycling and re-use. •How much waste the proposal is expected to generate, and how and where the waste will be managed in accordance with the waste hierarchy. •How performance will be monitored and reported.	√ √ √	J J	J J	J J J	~	√.	¥	Feasibility / Initia Surveys	al Approve the Primary Consultants Feasibility Report.	√	J		J
	Circular economy	Design Principles	<ol> <li>Maximise re-use: re-use the existing asset, recover materials and products on site or from another site, share materials or products for onward re-use.</li> <li>Design for optimisation: longevity, flexibility, adaptability .assembly, disassembly, and recoverability.</li> <li>Use standardisation: Designing and constructing buildings that apply standardised elements or modular designs for materials and products that enable a reduction in construction waste and easier re-use in next life.</li> <li>Product as a service: Establish and promote a payment structure through which customers have unlimited access to resources but only pay for what is used, or for the result linked to their use. This represents a transition from selling products to selling services.</li> <li>Minimise impact and design waste out: use low impact new materials, use recycled content or secondary materials, design out waste, and reduce construction impact.</li> </ol>		J J	√ √	J J J	1	A	J J	Feasibility / Initia Surveys	al Approve the Primary Consultants Feasibility Report.	V	V		J
		Building in Layers	I. RICS New Rules of Measurement (NRM) form the basis of CE statement reporting, outline application stage in the Bill of Materials. Building layers and their life span: •Site NRM 8. •Skin and shell (e.g., facade): 20-60 years NRM 2.3, 2.5, 2.6. •Structure, superstructure and frame: 30-120 years NRM 2.1, 2.2.2.4, 7 o SubStructure (e.g., excavation, foundation, basement) NRM 1. •Services (buildings): 7-30 years NRM 5. •Space plan / interior: 3 - 40 years 6 NRM 2.7, 2.8, 3 oConstruction materials: NRM 0. •Stuff and content: 3-5 years (FF&E).	J J J	√ √	J J	J J J	~	~	V	Feasibility / Initia Surveys	al Approve the Primary Consultants Feasibility Report.	V	✓		~
	Decommissioning	Adaptable Design	<ol> <li>Conduct a study to explore the ease of disassembly and the functional adaptation potential of different design scenarios, followed by recommendation and solutions covering:</li> <li>Options for multiple building uses and area functions based on design details, e.g. modularity.</li> <li>Routes and methods for major plant replacement, e.g. networks and connections have flexibility and capacity for expansion.</li> <li>Accessibility for local plant and service distribution routes, e.g. detailed information on building conduits and connections infrastructure.</li> <li>The potential for the building users to communicate the functional adaptability and disassembly characteristics of the asset.</li> </ol>	J J J	√ √	√ √	√ √	~	~	√	Concept Desigr	DT to prepare a Scheme n Design report on completion	V	√ √	V	~
		Demolition	<ol> <li>Complete a pre-demolition audit of any existing buildings, structures or hard surfaces being considered for demolition to determine how all materials arising from demolition and remediation works will be re-used and/or recycled. The audit must account for emissions associated with decommissioning and could be completed as part of the Circular Economy Statement.</li> <li>Embed Circular Economy Principles when refurbing historic building to utilise best practice low carbon interventions.</li> </ol>	J J J	~ ~	1 1	J J J	~	~	~	Concept Desigr	DT to prepare a Scheme Design report on completion	~	√ √	V	~
		Materials	<ol> <li>The waste hierarchy should be followed to firstly prevent waste being generated, preparing for re-use, recycling, recovery and finally disposal.</li> <li>Follow the Circular Economy principles for New Builds: waste reduction is planned from the project inception to completion, re-using secondary products and materials.</li> <li>Follow the Circular economy hierarchy for existing buildings: Retain, Refit, Refurbish, Reclaim/re-use, Re-manufacture, Recycle.</li> </ol>	J J J	1	√ √	J J J	~	V	√ √	Procurement Strategy	Procurement Strategy Report	~	V		J



#### (e.g., Offices) £250k - £5m E50m Requirements Performance requirements Class Asset type Value GO BACK Review opportunities for re-use and retention of existing buildings in line with the Decommissioning Category requirements. Architect shall undertake feasibility on building retention and re-use and advise whether brief can be met by using existing building. 3. Undertake pre-demolition / pre-refurbishment audit inline with Decommissioning Category requirements. This will help identify which building elements need to be $\sqrt{\sqrt{2}}$ $\sqrt{\sqrt{2}}$ $\checkmark$ $\checkmark$ $\checkmark$ $\checkmark$ 1 1 Design $\checkmark$ 4. All buildings should be designed to allow for future adaptation and change of function in line with the principles of a Circular Economy, Design Principles to extend Resource efficicency their life. Encourage waste minimisation and waste prevention through the re-use of materials and using fewer resources in the production and distribution of products. Meet the target for construction and demolition waste of 95% re-use/recycling/recovery under BREEAM. Implement a Site Waste Management Plan (SWMP) J J J J J J J J J J J J Construction $\checkmark$ $\checkmark$ $\checkmark$ Materials 1. Identify re-used or recycled materials and aim for at least 20% recycled or re-used content. Re-use/Recycle Re-use materials from demolished buildings and design future buildings for disassembly, to allow for materials to be re-used. J J J J J J J $\checkmark$ $\checkmark$ $\checkmark$ $\checkmark$ $\checkmark$ 3. Circular economy statements need to demonstrate how materials resulting from demolition and remediation works will be re-used/recycled. Low impact materials 1. Use low-carbon building materials such as low-carbon cement. Sustainably sourced materials tool used in construction. Sustainably sourced materials tool used in construction. Carry out material efficiency review to determine whether all materials proposed are necessary. Specify and use locally sourced materials. Sourcing materials J J J J J J J $\checkmark$ $\checkmark$ $\checkmark$ $\checkmark$ $\checkmark$ $\checkmark$ 5. Ensure longevity of materials. GO BACK 1. Undertake a pre-demolition / pre-refurbishment audit to identify opportunities for building (or building components) re-use. 2. Use a sustainable procurement plan that covers the following as a minimum: Procure construction products locally where possible. Include sustainability aims, objectives and strategic targets to guide procurement activities. Procurement of materals Construction $\checkmark$ $\checkmark$ $\checkmark$ $\checkmark$ $\checkmark$ $\checkmark$ Identify the risks and opportunities of procurement against a broad range of social, environmental and economic issues. For further information, please check CoLC Procurement Code Design for adaptability or flexibility. Design for disassembly. Design to avoid a premature end of life for all components through considering maintenance and durability. J J J J J J J $\checkmark$ $\checkmark$ $\checkmark$ $\checkmark$ $\checkmark$ Design 4. Design to prevent water damage. Material durability 1. Undertake a pre-demolition / pre-refurbishment audit to identify opportunities for building (or building components) re-use. $\checkmark$ Re-use 2. If re-use is not possible, materials may be carefully and selectively separated for processing and recycling into new elements, materials, and objects. Modern methods of construction 1. Include the type of MMC that will be deployed within the delivery programme inline with the GLA guidelines. 1 1 I $\checkmark$ $\checkmark$ $\checkmark$ $\checkmark$ Modern methods of construction $\checkmark$ $\checkmark$ $\checkmark$ (MMC) 2. Disclose whole life carbon performance at in use stage.

PM Guide Reference	PM Guide Task Description	Project Management	Building Surveying	Quantity Surveying	Architectural	Structural and Civil Engineering	Mechanical & Electrical Engineering	Fire Engineering	Interior Design Services	PassivHaus Design	Transportation	Contractor
PM Guide (Projec	ct Delivery Methodology) PPG Activities					Key S	takeh	olders				
Concept Design	DT to prepare a Scheme Design report on completion	~			~							~
Construction Programme	Review a detailed 4-week level 3 programme with an analysis of performance against the previous 4- week programme.	~			~							~
Concept Design	DT to prepare a Scheme Design report on completion	$\checkmark$			$\checkmark$	~			$\checkmark$			~
Procurement Strategy	Procurement Strategy Report	$\checkmark$			$\checkmark$	$\checkmark$			$\checkmark$			~
Construction Programme	Review a detailed 4-week level 3 programme with an analysis of performance against the previous 4- week programme.	$\checkmark$	$\checkmark$									~
Procurement Strategy	Procurement Strategy Report	$\checkmark$	$\checkmark$		$\checkmark$	$\checkmark$	$\checkmark$		$\checkmark$			
Concept Design	DT to prepare a Scheme Design report on completion	$\checkmark$	$\checkmark$		~	$\checkmark$	$\checkmark$		$\checkmark$			
Procurement Strategy	Procurement Strategy Report	$\checkmark$			$\checkmark$	$\checkmark$						$\checkmark$



Require Category / S		Performance requirements Performance standards and specifications from industry standards, regulations and guidance to set the CoL Standard Resilience	New build Refurb Listed Component replacement only	Residential Commercial (e.g., Offices) Public (e.g., Schools)	below £250k £250k - £5m £5m - £50m Above £50m	Technologies Whole Life Carbon Climate Impact Modelling (resilience Circular Economy Procurement	epino Wd PM Guide (Project D Task Bar	uoidipsee Q yse L epino We delivery Methodology) PPG Activities	Project Management Building Surveying Quantity Surveying Architectural Architectural Structural and Civil Engineering Mechanical & Electrical Engineering Fire Engineering Fire Engineering PassivHaus Design Transportation Contractor
	Overheating	<ul> <li>Measures to consider: <ol> <li>Solar shading to prevent solar gain through glazing.</li> <li>High thermal mass of building fabric to moderate temperature fluctuations. operate cooling stations</li> </ol> </li> <li>Passive ventilation and heat recovery - elemental approach to buildings that cannot be sufficiently retrofitted to get as close to Passivhaus standards as possible.</li> <li>Cool streets programme, pedestrian tunnels</li> <li>Heat resilient public realm and highway surfaces.</li> <li>Minimise contribution to the urban heat island effect.</li> <li>Self-standing structures such as canopies and shade sails.</li> <li>Incorporate pools and fountains in the public realm to increase cooling effect, utilise seawtaer / riverwater cooling as appropriate</li> <li>Improving air tightness of buildings that are mechanically ventilated / cooled, minimises how hard the mechanical units need to work to maintain temperatures.</li> <li>Consider painting external facades and roofs with paints that reflect solar radiation.</li> <li>Phase Cooling of specific areas only - work with building occupiers to agree plans to only occupy and operate specific cool areas during high heat days, and adjust all services to operate in specific areas only. Also oversize cooling systems.</li> <li>Live information of internal conditions</li> <li>Reflective window films and photochromic glazing, reduction of window sizes on south/east/west facades.</li> <li>Integrate Adiabatic Cooling - direct spraying water into ventilation systems</li> <li>Greening of public no spaces, tree planting, green roofs / wills</li> <li>Reduce office occupancy, and increase ceiling heights.</li> <li>Please note the Intervention Measures within the Climate Impact Modelling workstream within the GIS Tool.</li> </ul>	J J J J	J J J	J J J J	J J	F DT Appointments	Prepare a list of primary and secondary Consultants.	× × × × ×
	Flooding	<ol> <li>Flood risk assessment and mitigation.</li> <li>Sacrificial land and/or natural flood risk management areas.</li> <li>Flood defence assets maintenance and management regimes - protect key assets, critical infrastructure and sensitive equipment in flood zones.</li> <li>Sustainable rain and surface water management policies and implementation e.g. rainwater attenuation and SuDS.</li> <li>SuDs e.g. infiltration trenches, soakways, swales, natural detention basins, geocellular storage systems, biosolar roofs, blue green roofs, pervious pavements, rai gardens.</li> <li>Rainwater harvesting - added benefit of reducing water consumption.</li> </ol>	√ √ √ n	J J J	J J J J	V	F DT Appointments	Prepare a list of primary and secondary Consultants.	J J J J
	Other adaptation measures	<ol> <li>Improving Blue/Green Infrastructure.</li> <li>Biodiversity protection and enhancement for wildlife to survive changes in climate.</li> <li>Air quality impact assessment to ensure buildings and services will not contribute to worsening vulnerability to photochemical smog.</li> <li>Building retrofits.</li> <li>Increase the quality and provision of green space and coverage in the Square Mile and wider City Corporation spaces.</li> <li>Introduce climate-resistant and adaptive landscaping.</li> <li>Enhancing monitoring, surveying and tracking of ecosystem health.</li> <li>Strengthen water quality monitoring networks.</li> <li>Mitigate impacts of extreme weather events in line with BREEAM Wst 05 requirements and in line with assessment criteria in BREEAM, with a focus on structural and fabric resilience when applicable.</li> <li>Use of cool materials.</li> <li>Solider precipitation prevention measures including:         <ul> <li>Bio retention swales / rain gardens in open spaces and along wider streets, bio retention planters</li> <li>Temporary Detention Basins in hard surfaced areas</li> <li>Smart Underground rainwater harvesting water attenuation tanks</li> <li>Permeable surfacing and storage, oversized kerb drainage</li> </ul> </li> </ol>	J J J J	J J J	J J J J	V	Concept Design	)T to prepare a Scheme Design report on completion	✓ ✓ ✓ ✓ ✓
	Community resilience	Consider the following measures: 1. Action to tackle food poverty. 2. Support mutual aid and community aid groups. 3. Climate-ready, fortified public health programmes. 4. Strengthen community and business networks to build adaptive capacity. 5. Emergency support and contingency planning for food networks and businesses. 6. Reduce vulnerability by empowering and engaging communities, supportive livelihoods and tackling health inequalities. 7. Cross-boundary and inter-agency working, particularly those to address flood risk, water scarcity and other climate risks with a close link to public health.	J J J	√ √	J J J J	N/A	Concept Design	)T to prepare a Scheme Design report on completion	✓
Climate Change Adaptation	Planning & management	<ul> <li>Consider the following measures:</li> <li>1. Develop financial package and programme to manage resilience actions.</li> <li>2. Embed principles of inclusion and equity throughout all climate action strategies.</li> <li>3. Mainstream climate resilience into City Corporation governance and decision-making.</li> <li>4. Identify resilience risks to the Corporation's buildings.</li> <li>5. Public communications and awareness raising campaigns.</li> <li>6. Strengthen City Corporation knowledge, skills and capacity.</li> <li>7. Emergency planning.</li> <li>8. Continue to fund flood modelling.</li> <li>9. Develop urban heat vulnerability index and mitigation strategy.</li> <li>10. Review above and below ground space utilisation in the Square Mile.</li> <li>11. Ports and market soperational resilience planning.</li> <li>12. Establish research partnerships to inform future action planning and management of natural capital.</li> <li>13. Open a City Corporation Ecological Research and Education programme.</li> <li>14. Poets and disease horizon scannes carch programme.</li> <li>15. Model food supply networks through the Square Mile to inform future planning.</li> <li>16. Explore and facilitate opportunities to promote regional food production.</li> </ul>	J J J J	J J J	J J J J	J		Prepare a list of primary d secondary Consultants Identify Risks Initial Risk workshop	✓



373	Require	ements	Porformance convicemente	New build	Refurb Listed Component replacement only	Residential Commercial (e.g., Offices) Public (e.g., Schools)	below £250k	£250k - £5m £5m - £50m Above £50m	Technologies	Whole Life Carbon	dimate impact modeling (resilence Circular Economy Procurement	PM Guide Reference	M Guide Task Description	Project Management	Quantity Surveying	Architectural Structural and Civil Engineering	Mechanical & Electrical Engineering	File Engineering Interior Design Services	Passivinaus vesigin Transportation Contractor
			Performance requirements	A	sset type	Class		Value		Interdepe	endencies					Key St	takeholde	irs	
GOBACK	Category / S	Sub-category	Performance standards and specifications from industry standards, regulations and guidance to set the CoL Standard     17. Review and expand data collection, monitoring and reporting.     18. Strengthen resilience requirements for planning.     19. Diversify energy sources and partner with regional organisations and utility providers to increase back-up power for critical services.     20. Develop Citly Corporation and Square Mile water footprint management strategy.     21. Work with partners to accelerate actions to address water leak management.     22. Food 'waste' collection and redistribution system.     32. GAS plan aims to achieve a climate ready Citly Corporation avoiding disruption to services from climate risks and preparing the Square Mile to adapt to future climate projections.     24. Make climate resilience priorities for the markets and how theses can be acted upon.     25. Define climate resilience strategy that covers market operations, assets, and tenant businesses.									Task Bar	PPG Activities						
			<ol> <li>BREEAM Hea 04 Thermal comfort: Thermal modelling to be carried out in accordance with BRE Hea 04 requirements.</li> <li>The Building should be designed to limit the risk of overheating in accordance with adaptive comfort methodology such as CIBSE TM52 standards.</li> </ol>	~	√ √	√ √ √				``	/	DT Appointm	Prepare a list of primary and secondary Consultants.	√ √	√ √	1 1	1	~ ~	~
		Thermal Comfort and safety	<ol> <li>Promote occupants activity, comfort and well being by providing quality thermal comfort which reduces heat loss and energy usage.</li> <li>Design alternatives for regularly occupied buildings (dependant on building type):</li> <li>Localised active cooling or heating systems.</li> <li>Passive systems such as nightime air, wind flow.</li> <li>Individual thermal controls for at least 50% of individual occupant spaces and option to adjust air temperature, radiant temperature, air speed and humidity.</li> </ol>	~	J J	J J J					/	DT Appointm	Prepare a list of primary ants and secondary Consultants.	1 1	√ √	r 🗸	~ ~	J J	1
			I. Incorporate mechanical cooling/other cooling in occupied spaces – strategies for this include:     -Passive Ventilation.     -Operable Windows.     -Exterior/Interior Window Shading.     -Shade Structures.     -Increased Insulation.     +High Performance Windows and Facades.     -Solar + Storage.     -Celling Fans.	V	√ √	J J J			V		/	DT Appointm	Prepare a list of primary ants and secondary Consultants.	√ √	√ √	r v	J J	J J	J
		Designing for heat resilience	<ol> <li>Select materials and systems using climate change projections to design a heat resilient facility and reduce the risk of overheating such as:         <ul> <li>Passive daylighting solutions.</li> <li>Vertically stacked double skin facades.</li> <li>Exterior window shades.</li> <li>Light-coloured exteriors.</li> <li>Shaded arcades.</li> <li>Thermally massive materials.</li> <li>Optimise building layout by:</li> <li>Segregating temperature-sensitive electronics and computer control system from other systems.</li> <li>Iplacing heat-generating equipment like transformers and switchgear outdoors, where permitted.</li> <li>Splitting the facility cooling loads among different HVAC systems in the facility for redundancy and improved multi-zone control.</li> <li>Identify heat-related points of failure and include design interventions such as:</li> <li>Selecting systems with higher heat tolerance.</li> <li>Adding Energy Recovery Ventilation systems.</li> <li>Providing additional or redundant ventilation systems, either mechanical or natural, to cool electrical equipment or ventilate subsurface tunnels.</li> </ul> </li> </ol>	V	√ √	J J J				Ň	/	DT Appointm	Prepare a list of primary and secondary Consultants.	√ √	√ 、	<ul> <li>✓</li> </ul>	√ √	~ ~ ~	1
			(House of Commons Environmental Audit Commitee, water quality in rivers fourth report) 1. Work to improve the quality of local water sources by monitoring pollutant levels, embedding SUDS in projects and reducing the use of pollutants during the construction, use and decommissioning of a site to improve local water quality. This will help to insure key freshwater species like Eels and Barbels are protected.	$\checkmark$	√ √	J J J	√ √	√ √ √		``	/		Prepare a list of primary and secondary						
GO BACK		Water quality	(London sustainable drainage action plan & London Assembly at home with nature - Encouraging biodiversity in new housing developments) 1. Protect diversity and encourage biodiversity by, where possible, including onsite green infrastructure such as water retention ponds and ensure all future buildings have sustainable measures as part of normal practice.	s√	√ √	√ √ √	~	J J J			(	DT Appointm	Consultants. To complete and review the Schedule of services	√ √	√ √	,			$\checkmark$
			(London sustainable drainage action plan & London Assembly at home with nature - Encouraging biodiversity in new housing developments) 1. Establish, where approproate site based treatment and recycling programmess	$\checkmark$	J J	√ √	~	√ √ √			/		and scope of works reflects the Project requirements.						
			Requirements as per Water pollution and monitoring requirments within Pollution Minimisation	$\checkmark$	√ √	√ √ √	′ √	$\checkmark$ $\checkmark$ $\checkmark$		```	/								
		Planning	<ul> <li>(City of London Climte Action Strategy)</li> <li>1. Introduce land management practices as per the Environment Bill, to show planners a 10% net gain in biodiversity will result before any project is green-lit - dependant on:</li> <li>•The site.</li> <li>•Soil management.</li> <li>•Reducing the removal and re-deposition of soil on site.</li> <li>•All non-planned paved areas to have sufficient soil depth and quality for growing vegetables.</li> <li>•On or off site tree planting and maximise the ability to remove carbon.</li> <li>•Optimise biodiversity and resilience value.</li> </ul>	V	√ √	√ √ √	· √	√ √ √		N	/A	DT Appointm	Prepare a list of primary and secondary Consultants. ents To complete and review the Schedule of services	√ √	√ √				~
	Biodiversity, ecology and conservation		As per BREEAM Land Use & Ecology (LE) credits: 1. The client or contractor confirms compliance is monitored against all relevant UK and EU or international legislation relating to the ecology of the site. 2. The site is evaluated using the BREEAM Ecological Risk Evaluation Checklist, a Suitably Qualified Ecologist (SQE) carries out survey and evaluation to influence site preparation, works, layouts. 3. Risks and feasibility of enhancement of the sites ecological value is included within the decisions made during site preparation, design and construction works. 4. A section on Ecology and Biodiversity has been included as part of the tenant or building owner information. 5. A landscape and ecology management plan or equivalent has been developed in accordance with BS 42020: 2020 Section 11.1.		√ √	J J J	· √	J J J		N	/A		and scope of works reflects the Project requirements.	√ √	√ √				1



GO BACK

Requ

Cated

## **DESIGN GUIDE - PROJECT REQUIREMENTS**

			New build	Refurb	Listed Communent renlacement only	Residential	Commercial (e.g., Offices)	Public (e.g., Schools)	below £250k	£250k - £5m	£5m - £50m	Above £50m	Technologies Wheelo Life Corbox	whole Life Carbon Climate Impact Modelling (resi	Circular Economy
luir	rements	Performance requirements		Asset	t type	¢	Class			Valu	ıe		In	terdepend	dencie
y / S	Sub-category Mitigating risks	Performance standards and specifications from industry standards, regulations and guidance to set the CoL Standard  1. Negative impacts from site preparation and construction works are managed according to the mitigation hierarchy and SQEs recommendations as outlined in BREEAM LE03 credit. 2. (LEED) Protect or restore habitat – Preserve and protect from all development and construction activity 40% of greenfield area on the site (if exists). 3. Restore a portion of the site identified as previously disturbed. 4. At least 75% of the proposed development is on previously occupied land, if the land is deemed contaminated, a contaminated land professional undertakes site investigation and confirms that a remediation strategy will be implemented.	~	V	~	~	~	~	~	√	√	~		N/A	
	Ecological change and enhancement	<ol> <li>Change and enhance ecology by adopting locally relevant ecological measures from recognised local ecological expertise, in collaboration with representative stakeholders.</li> <li>Positive change in ecological value (significant net gain) as a result of the project in accordance with BREEAM and HQM Ecology Calculation methodology.</li> <li>If unable to enhance ecology on site, include measures for the projects zone of influence.</li> <li>Adopt a Biodiversity strategy which incorporates tree planting to address both biodiversity and climate change concerns. This will include discouraging Landscaped areas requiring high irrigation, unless fed by rainwater or grey water collected on site to account for periods of drought due to climate risks. and selecting drought tolerant Species for window boxes.</li> <li>Implement an Urban Greening strategy; green roofs and green walls as appropriate.</li> <li>Cong term management and maintenance of locogy throughout the project has been implemented through input from the project team in collaboration with other stakeholders. Detailed management and maintenance plans are included within tenant or building owner information that encourages understanding and supportive behaviours.</li> </ol>	V	V	V	~	~	~	V	~	1	J		N/A	
	Planning and implementation	<ol> <li>Mitigate impacts of extreme weather events in line with BREEAM Wst 05 requirements and in line with assessment criteria in BREEAM, with a focus on structural and fabric resilience when applicable.</li> <li>Avoid construction on high flood risk areas inline with LEED LT credit.</li> <li>Ensure compliance with the following CoLC Local Plan Policies:</li> <li>Section 3.18.1 Core Strategic Policy CS18: flood risk</li> <li>Policy DM 18.1 Development in the City Flood Risk Area</li> <li>Policy DM 18.2 Sustainable Drainage Systems</li> <li>Sewer infrastructure design must allow for projected future sea level rise (SLR) increases in precipitation and frequency of high storm intensity.</li> </ol>	~	~	V	~	~	~	~	V	1	V		V	

	Flood and surface water management	<ul> <li>(BREEAM Pol 03 Flood and surface water management) Ensure the following:</li> <li>(SuDs are considered by all developers in new major developments and should, where possible, provide multifunctional benefits.</li> <li>There is no discharge from the developed site for rainfall up to 5 mm (confirmed by the appropriate consultant).</li> <li>Areas with a low risk source of watercourse pollution, an appropriate level of pollution prevention treatment is provided, using appropriate SuDS techniques.</li> <li>Areas with a high risk of contamination or spillage of substances, such as petrol and oil, have separators (or an equivalent system) are installed in surface water drainage systems.</li> <li>Chemical or liquid gas storage areas have a means of containment fitted to the site drainage system (i.e. shut-off valves). This is to prevent the escape of chemicals to natural watercourses in the event of a spillage or bunding failure.</li> <li>All water pollution prevention systems have been designed and installed in accordance with the recommendations of documents such as the SuDS manual2 and other relevant industry best practice. They must be bespoke solutions taking account of the specific site requirements and natural or man-made environment of and surrounding the site.</li> <li>A comprehensive and up to date drainage plan of the site will be made available for the building or site occupiers.</li> <li>Relevant maintenance agreements for the ownership, long term operation and maintenance of all specified SuDS must be in place.</li> <li>All external storage and delivery areas are designed and detailed in accordance with the current best practice planning guidance.</li> </ul>	~	~	J	~	~	~	V	V	\$	4		√	
		(BREEAM Pol 03 Flood and surface water management) To increase the resilience and resistance of the development to flooding: 1. The ground level of the building and access to both the building and the site, are designed (or zoned) so they are at least 600 mm above the design flood level of the site's flood zone (see 600mm threshold). 2. The final design of the building and the wider site reflects the recommendations made by an appropriate consultant in accordance with the hierarchy approach outlined in section 5 of BS 8533: 2017	$\checkmark$	~	V	V	√	V	V	$\checkmark$	1	~		~	
I resilience		Tree planting 1. Trees can be used as standalone features within soil-filled tree pits, tree planters or structural soils. Tree pits and planters can be designed to collect and attenuate runoff by providing additional storage within the underlying structure (CoL Flood risk assessment, 2017). 2. It is crucial that tree species are chosen for their adaptability to the prevailing site conditions rather than a strict adherence to only native species (City of Westminster, 2010). 3. Bringing plants back where construction and high rates of urban growth have removed valuable eco-systems is key to creating sustainable comfortable cities. Urban greening will prevent climate events such as flooding and heat waves.		~	√	~	√	V	V	V	~	~		~	
		<ol> <li>Existing surfaces provide a surface suitable for pedestrian and/or vehicular traffic, while allowing rainwater to infiltrate through the surface and into underlying layers.</li> <li>Specify surfaces with an aggregate sub-base to provide good water quality treatment before water is infiltrated to the ground, re-used, or discharged to a watercourse or other drainage system.</li> </ol>	~	~	V	V	√	V	~	~	~	~		J	

GO BACK

PM Guide Reference	PM Guide Task Description	Project Management	Building Surveying	Quantity Surveying	Architectural	Structural and Civil Engineering	Mechanical & Electrical Engineering	Fire Engineering	Interior Design Services	PassivHaus Design	Transportation	Contractor
PM Guide (Projec	t Delivery Methodology)					Key S	takeh	olders				
Task Bar	PPG Activities											
DT Appointments	Prepare a list of primary and secondary Consultants. To complete and review the Schedule of services and scope of works reflects the Project requirements.	~	V	~	~							~
DT Appointments	Prepare a list of primary and secondary Consultants. To complete and review the Schedule of services and scope of works reflects the Project requirements.	Ą	V	~	V							~
DT Appointments	Prepare a list of primary and secondary Consultants. To complete and review the Schedule of services and scope of works reflects the Project requirements.	~	V	$\checkmark$	√	$\checkmark$	$\checkmark$					~
DT Appointments	Prepare a list of primary and secondary Consultants. To complete and review the Schedule of services and scope of works reflects the Project requirements.	V	~	~	V	~	~					~
DT Appointments	Prepare a list of primary and secondary Consultants. To complete and review the Schedule of services and scope of works reflects the Project requirements.	1	V	~	~	√	√					1
DT Appointments	Prepare a list of primary and secondary Consultants. To complete and review the Schedule of services and scope of works reflects the Project requirements.	~			~	$\checkmark$	$\checkmark$					$\checkmark$
DT Appointments	Prepare a list of primary and secondary Consultants. To complete and review the Schedule of services and scope of works reflects the Project requirements.	~			√	$\checkmark$	$\checkmark$					~



375				New build	reruit) Listed Component replacement only	Residential	Commercial (e.g., Offices) Public (e.g., Schools)	below £250k £250k - £5m	£5m - £50m Above £50m	Technologies Whole I ife Carbon	Climate Impact Modelling (resilience	Circular Economy Procurement	PM Guide Reference	PM Guide Task Description	Project Management Building Surveying	Quantity Surveying Architectural	Structural and Civil Engineering	wecnancal & Electrical Engineering Fire Engineering	Interior Design Services PassivHaus Design	Transportation Contractor
	Require	ements	Performance requirements	As	set type	c	lass	v	alue	Int	terdepend	encies	PM Guide (Projec	ct Delivery Methodology)			Key Stake	eholders		
	Category / S	sub-category	Performance standards and specifications from industry standards, regulations and guidance to set the CoL Standard										Task Bar	PPG Activities						
٩		Design	<ol> <li>Include a rainwater collection basin or a detention basin in the design and as part of the SuDS management system to help with attenuate runoffs and also to address all non-potable water consumptions (such as WC flushing) during construction and operation of the asset.</li> <li>Consider including the following water runoff storage and/or conveyance structures in the design as approperiate:         <ul> <li>Infiltration trenches to create temporary subsurface storage of stormwater runoff.</li> <li>Swales to store and/or convey runoff and remove pollutants.</li> <li>Soakaways to store or drain the water in large areas such as highways.</li> <li>Natural Detention basins to remove pollution and reduce runoff downstream.</li> <li>Blue Green Roofs as a source-control feature</li> <li>Green Roofs to intercept and retain precipitation, reducing the volume of runoff and attenuating peak flows.</li> </ul> </li> </ol>	√ ,	1 4	~	√ √	1	J J		A		DT Appointments	Prepare a list of primary and secondary Consultants. To complete and review the Schedule of services and scope of works reflects the Project requirements.	~	V	√ √			J
СОВАСК			1. New developments must be constructed with separate down pipes for foul and surface water which will aid with conversion in the future should new surface water pipes be constructed within the City of London. 2. Site drainage should be designed inline with Thames Water recommendations should only be combined at the final manhole prior to leaving the site and entering the combined sewer.	√ ,	1 4	1	√ √	J J	√ √		V		DT Appointments	Prepare a list of primary and secondary Consultants. To complete and review the Schedule of services and scope of works reflects the Project requirements.	~	V	J J			J
			<ol> <li>Use methods and materials that reduce the impact from a flood, ensuring that structural integrity is maintained, and the drying out and cleaning required, following inundation and before reoccupation, is minimised.</li> <li>Where flood resistance measures are not appropriate, enhance the features of the property so that they resist the ill-effects of flood water and dry out quickly and without permanent damage.</li> </ol>		1 4	~	J J	J J	√ √		~		DT Appointments	Prepare a list of primary and secondary Consultants. To complete and review the Schedule of services and scope of works reflects the Project requirements.	√	V	~ ~			~
			1. BREEAM Tra 01 Transport assessment and Travel Plan - no later than Concept Design stage, undertake a site-specific transport assessment (or develop a travel statement) and draft travel plan, which can demonstrably be used to influence the site layout and built form.     2. This should include (where relevant)     Travel patterns and transport impact of future building or site users     Current local environment for pedestrians and cyclists     Vumber of existing accessible amenities within 500m of the site     Disabled access     Current facilities for cyclists     Sased on the transport assessment develop a travel plan that provides a long term management strategy which encourages more sustainable travel such as negotiating with local bus, train or tram companies to increase local provision, provision of EV charging stations for a minimum of 3kW for at least 10% of the total car parking capacity for the development, provision of parking priority spaces for car sharers – at least 5% of the total car parking capacity.		/ √		√ √	J J	√ √	v	/		DT Appointments	Prepare a list of primary and secondary Consultants. To complete and review the Schedule of services and scope of works reflects the Project requirements.	V	~			<i>(</i> ,	J J
			1. BREEAM Tra 02 – Provide Cyclist facilities based on the number of building occupants from the sliding scale of compliance, such as storage spaces, showers, lockers and changing facilities.	√ ,	/ ↓	~	J J	J J	√ √		N/A		DT Appointments	Prepare a list of primary and secondary Consultants. To complete and review the Schedule of services and scope of works reflects the Project requirements.	√ √					√ √
GOBACK		Transport	<ol> <li>During construction, where possible, use electric construction vehicles such as excavators, forklifts and loaders from local suppliers.</li> <li>Identify opportunities to purchase electric construction vehicles within the City of London to support with a Transition to a Zero Emission Fleet.</li> </ol>	√ ,	1 4	1	√ √	J J	J J		N/A		DT Appointments	Prepare a list of primary and secondary Consultants. To complete and review the Schedule of services and scope of works reflects the Project requirements.						J J
			<ol> <li>Monitor and measure the transport of construction materials to minimise air quality impacts (BREEAM Man 03 Responsible Construction practices):         <ul> <li>Ensure processes are in place to facilitate collecting and recording feedback from the community and to address any concerns related to the development footprint.</li> <li>Assign responsibility to an individual for monitoring, recording and reporting transportation data resulting from all on-site construction processes (and dedicated off-site manufacturing) throughout the build programme.</li> <li>Report the total carbon dioxide emissions (total kgCO₂/project value) from the construction process via BREEAM Projects.</li> <li>Set targets for transportation movements and impacts resulting from delivery of the majority of construction materials to site and construction waste from site. As a minimum cover:</li> <li>Transportation of materials from the point of supply to the building site, including any transport, intermediate storage and point of supply monitor as a minimum:             <ul> <li>Materials used in major building elements.</li> <li>Ground works and landscaping materials.</li> <li>Transportation of construction gate from the construction gate to waste disposal processing or recovery centre gate. This monitoring must cover the construction waste groups outlined in the project's resource management plan.</li> <li>Report separately for materials and waste, the total transport-related carbon dioxide emissions (kgCQ₂-eq), plus total distance travelled (km).</li> </ul> </li> </ul></li></ol>		/ 4	4	√ √	J J	√ √		N/A		DT Appointments	Prepare a list of primary and secondary Consultants. To complete and review the Schedule of services and scope of works reflects the Project requirements.					" ,	J J



GO BACK

GOBACK

## **DESIGN GUIDE - PROJECT REQUIREMENTS**

					tonly	(s				g (resilience		<u>6</u>			Engineering	
				New build Refurb	Listed Component replacemen	Residential Commercial (e.g., Office Public (e.g., Schools)	below £250k £250k - £5m	£5m - £50m Above £50m	Technologies	Whole Life Carbon Climate Impact Modellin Clicular Economy Procurement	PM Guide Reference	PM Guide Task Descrip	Project Management Building Surveying Quantity Surveying	Architectural	Mechanical & Electrical Fire Engineering	PassivHaus Design Transportation Contractor
	Requirements		Performance requirements	Ass	et type	Class	Ň	alue		Interdependencies		t Delivery Methodology)		Key	Stakeholders	
	Category / Sub-cate	agory	Performance standards and specifications from industry standards, regulations and guidance to set the CoL Standard					_			Task Bar	PPG Activities				
ו	Nitrog		If this cannot be met, ensure the below can be: •Ensure appliances installed align with the maximum NOx emissions levels for 2 credits under BREEAM Pol 02 including: oCas Boilers, Low and high pollution location – 24mg/kWh.	√ √	~	√ √	√ √	J J	~		DT Appointments	Prepare a list of primary and secondary Consultants. To complete and review the Schedule of services and scope of works reflects the Project requirements.				
9			<ol> <li>BREEAM Pol 02 local air quality – VOC and PM.</li> <li>Ensure appliances (mg/m³) installed align with the maximum VOC and PM10 emissions levels for 2 credits including;</li> <li>Biomass boilers – Low pollution location, PM 11, VOC 5. High pollution location, PM 4, VOC 5</li> <li>Solid fossil fuel boiler - Low pollution location, PM 17, VOC 5. High pollution location, PM 4, VOC 5</li> <li>Wood pellet closed face local space heater - Low pollution location, PM 25, VOC 22. High pollution location, PM 10, VOC 10</li> <li>Biomass and solid fuel closed face local space heater - Low pollution location, PM 25, VOC 25. High pollution location, PM 10, VOC 10</li> </ol>	√ √	V	J J	√ √	J J	~		DT Appointments	Prepare a list of primary and secondary Consultants. To complete and review the Schedule of services and scope of works reflects the Project requirements.	√ √	~	J	√ √
			<ol> <li>Ensure products align with the exemplary level Formaldehyde and TVOC emissions requirements for BREEAM;</li> <li>Interior paints and coatings; Formaldehyde ≤ 0.01 mg/m³, TVOS ≤ 0.3 mg/m³, TSVOC ≤ 0.1 mg/m³. Category 1A and 1B carcinogens; ≤ 0.001 mg/m³.</li> <li>Wood based products including wood flooring; Formaldehyde ≤ 0.02 mg/m³, TVOS ≤ 0.3 mg/m³, TVOS ≤ 0.1 mg/m³, Category 1A and 1B carcinogens; ≤ 0.001 mg/m³.</li> <li>Flooring materials (including floor level compounds and resin floor); Formaldehyde ≤ 0.01 mg/m³, TVOS ≤ 0.3 mg/m³, TSVOC ≤ 0.1 mg/m³. Category 1A and 1B carcinogens; ≤ 0.001 mg/m³.</li> <li>Cating wall, acoustic and thermal insulation materials; Formaldehyde ≤ 0.01 mg/m³, TVOS ≤ 0.3 mg/m³, TSVOC ≤ 0.1 mg/m³. Category 1A and 1B carcinogens; ≤ 0.001 mg/m³.</li> <li>Interior adhesive and sealants (including flooring adhesive); Formaldehyde ≤ 0.01 mg/m³, TVOS ≤ 0.3 mg/m³, TSVOC ≤ 0.1 mg/m³. Category 1A and 1B carcinogens; ≤ 0.001 mg/m³.</li> </ol>	√ √	J	-J - J	J J	J J		N/A	DT Appointments	Prepare a list of primary and secondary Consultants. To complete and review the Schedule of services and scope of works reflects the Project requirements.	√ √	4	V	√ √
Loc	Fine F	Particulate Matter	<ol> <li>Annual Average PM10 value of 20 μg/m³.</li> <li>Development that would result in deterioration of the City's Nitrogen dioxide or PM10 pollution levels will be resisted.</li> </ol>	J J	J	-J - J	1	J J		N/A	DT Appointments	Prepare a list of primary and secondary Consultants. To complete and review the Schedule of services and scope of works reflects the Project requirements.				
			1. Annual Average PM2.5 value of 10µg/m³.	J J	J	-J - J	J J	J J		N/A	DT Appointments	Prepare a list of primary and secondary Consultants. To complete and review the Schedule of services and scope of works reflects the Project requirements.	V	4	~	J J
)			1. Undertake an annual assessment of air quality to ensure levels of Nitrogen dioxide in 90% of the Square Mile meet health-based Limit Values and WHO Guideline by 2025.	J J	J	√ √ √	1	J J		N/A	DT Appointments	Prepare a list of primary and secondary Consultants. To complete and review the Schedule of services and scope of works reflects the Project requirements.	V	4	V	J J
			1. Developers are required to provide Air Quality Impact Assessments as applicable.	√ √	J	J J J	J J	J J		N/A	DT Appointments	Prepare a list of primary and secondary Consultants. To complete and review the Schedule of services and scope of works reflects the Project requirements.	J	A	J	✓ <i>√</i>
	Air Qu		<ol> <li>Option to follow EIA guidance; development plans may be required to conduct Environmental Impact Assessment Screening Matrix checklist surrounding the possible impacts of the proposed development to air pollution. They may also need to consider.</li> <li>What are the observed trends shown by recent air quality monitoring data and what would happen to these trends in light of proposed development and / or allocations.</li> <li>The impact of point sources of air pollution (pollution that originates from one place).</li> <li>The potential cumulative impact of a number of smaller developments on air quality as well as the effect of more substantial developments, including their implications for vehicle emissions.</li> <li>Ways in which new developments could be made appropriate in locations where air quality is or is likely to be a concern, and not give rise to unacceptable risks from pollution. This could, for example, entail identifying measures for offsetting the impact on air quality arising from new development including supporting measures in an air quality action plan or low emissions strategy where applicable.</li> <li>Opportunities to improve air quality or mitigate impacts, such as through traffic and travel management and green infrastructure provision and enhancement.</li> </ol>	√ √	V	J J J	~ ~	J J		N/A	DT Appointments	Prepare a list of primary and secondary Consultants. To complete and review the Schedule of services and scope of works reflects the Project requirements.	~	~	J	✓ ✓



GO BACK

# **DESIGN GUIDE - PROJECT REQUIREMENTS**

			New build	Refurb	Listed Component replacement only	Residential	Commercial (e.g., Offices)	Public (e.g., Schools)	below £250k	£250k - £5m £5m - £50m	Above £50m	Technologies Whole Life Carbon	Climate Impact Modelling (resilience	Circular Economy Procurement	
Requir	ements	Performance requirements	А	lsset t	ype		Class	;		Value		Inte	erdependen	cies	
Category / S	Sub-category	Performance standards and specifications from industry standards, regulations and guidance to set the CoL Standard			_	L									
		1. (DEFRA Air Quality Monioring Methods) Identify, where possible the opportunity to include air quality monitoring tools to be installed at strategic locations in and around the project site such as those which have MCERTS certification.	~	√	1	V	~	V	~	√ √	~		N/A		
	Indoor air quality	<ol> <li>BREEAM Hea 02 IAQ plan and Post construction indoor air quality measurement: Pre – occupancy</li> <li>Produce a site specific indoor air quality plan to facilitate a process that leads to design, specification and installation decision around minimising indoor air pollution during occupation of the building. The Indoor air quality plan must consider the following:         <ul> <li>Removal of contaminant sources.</li> <li>Dilution and control of contaminant sources.</li> <li>Dilution and control of contaminant sources.</li> <li>Where present, consideration is given to the air quality requirements of specialist areas such as laboratories.</li> <li>Procedures for pre-occupancy flux bout.</li> <li>Third party testing and analysis.</li> <li>Maintaining good indoor air quality measurement.</li> </ul> </li> <li>The formaldehyde concentration in indoor air is measured post construction (but pre-occupancy) and does not exceed 100µg/m³ averaged over 30 minutes (World Health Organization guidelines for indoor air quality: Selected pollutants, 2010).</li> <li>The formaldehyde concentration in indoor air is measured post construction (but pre-occupancy) and does not exceed 100µg/m³ averaged over 30 minutes (World Health Organization guidelines for indoor air quality: Selected pollutants, 2010).</li> <li>The total volatile organic compound (TVOC) concentration in indoor air is measured post construction (but pre-occupancy) and does not exceed 500µg/m³over 8 hours.</li> <li>The total volatile organic and analysis is performed in accordance with ISO 16000-5 and ISO 16007-1.</li> <li>Where levels are found to exceed these limits, the project team confirms the measures that have, or will be, undertaken in accordance with the IAQ plan, to reduce the TVOC and formaldehyde levels to within the above limits.</li> <li>The rovOC sampling and analysis is performed in accordance with ISO 16000-5 and I</li></ol>	4	J	V	1	~	√	~	J J	4		N/A		
		1. As a minimum, the passive design analysis should cover:     - Site location.     -Site veather.     -Microclimate.     -Building layout.     -Building or:     -Building form.     -Building form.     -Building form.     -Building form.     -Building cocupancy type.     -Daylighting strategy.     -Ventilation strategy.     -Ventilation to climate change.     -Daylighting strategy.     -Ventilation to climate change.     -Daylighting strategy.     -Neremate change.     -Daylighting strategy.     -Ventilation to climate change.     -Daylighting strategy.     -Neremate change.     -Daylighting strategy.     -Neremate change.     -Daylighting strategy.     -Neremate change.											√		
	Analysis	<ul> <li>Design stage and identifies opportunities for the implementation of passive design solutions and retrofit measures that reduce energy demand.</li> <li>2. Use passive design measures to reduce total heating, cooling, mechanical ventilation and lighting loads and energy consumption in line with results of passive design analysis.</li> <li>3. Utilise passive HVAC strategies.</li> <li>4. Provide direct exhaust airflow measurement device and automatic indication devices on all natural ventillation openings intended to meet the minimum opening requirements.</li> <li>5. Highlight to developers the need for passive heat gain, resulting in smaller, simpler heating and hot water systems e.g.: prioritise reduced fabric heat loss so that incidental room heat gains can become primary heat source.</li> <li>6. Ensure that design decisions reflect the energy hierarchy - seek to limit building energy demand through passive measures and efficient fabric design prior to considering systems' optimisation to satisfy demand.</li> <li>7. Integrate passive design features to mitigate cooling demand into proposals as outlined in the Energy Statement, these are to be applied and elaborated in the design development and reserved matters stages, (in accordance with the Adaptive Pathways Implementation Plan).</li> <li>8. In accordance with NYC Climate resilience design guidelines all efforts should be made to reduce the Urban Heat Island effect with a minimum of 50% of the projects site area to be shaded, vegaetated and/or high solar reflectance surfaces. As well as passive ventilation design and passive design and passive daylight solutions being consciously considered.</li> </ul>	V	~		~	V	√				J	V		
Passive design		Planning and assessments 1. Complete and document a site survey or assessment that includes heat island effect potential •Leads to identification of paving, shading, or roofing materials that can be included.(LEED v4.1 Building Design and Construction Site Assessment). 2. Identify key buildings at risk of contributing to the urban heat island. 3. Evaluate sources of heat pollution that contribute to the Urban Heat island including developing strategies relating to: •Waste Heat recovery technology. •Electric charging infrastructure for medium and heavy duty vehicles. +HVAC controls for intermittent ventilation (New York Design Guide).	1	√	4	V	V	$\checkmark$					V		
	Heat island effect	Roof measures: LEED v4/1 Building Design and Construction Site Assessment 1. Use roofing materials that have an aged SRI equal to or greater than 64 (low sloped roof) and 32 (steep sloped roof). 2. Install a vegetated roof. 3. Parking; place a minimum of 75% of parking spaces under cover. The roof must have an fed SRI of at least 32, be a vegetated roof or be covered in energy generation systems.	~	V	~	V	~	V					V		

PM Guide Reference	PM Guide Task Description	Project Management	Building Surveying	Quantity Surveying	Architectural	Structural and Civil Engineering	Mechanical & Electrical Engineering	Fire Engineering	Interior Design Services	PassivHaus Design	Transportation	Contractor	
M Guide (Projec	t Delivery Methodology)												
Task Bar	PPG Activities				l	Key S	takeh	olders					
Task Dal													
T Appointments	Prepare a list of primary and secondary Consultants. To complete and review the Schedule of services and scope of works reflects the Project requirements.		V		V				V		V	V	
T Appointments	Prepare a list of primary and secondary Consultants. To complete and review the Schedule of services and scope of works reflects the Project requirements.		√		V				√		V	V	
T Appointments	Prepare a list of primary and secondary Consultants. To complete and review the Schedule of services and scope of works reflects the Project requirements.	V			V		~						
T Appointments	Prepare a list of primary and secondary Consultants. To complete and review the Schedule of services and scope of works reflects the Project requirements.	~					~						
T Appointments	Prepare a list of primary and secondary Consultants. To complete and review the Schedule of services and scope of works reflects the Project requirements.	V	V									$\checkmark$	
T Appointments	Prepare a list of primary and secondary Consultants. To complete and review the Schedule of services and scope of works reflects the Project requirements.	V			~	~	√		~			$\checkmark$	
		-	-						_		-		



Requirements

## **DESIGN GUIDE - PROJECT REQUIREMENTS**

# or Standard ated blanters and must be in blace we an aged Solar reflectance value

Category / Sub-cat	gory Perform	ance standards and specifications from industry standards, regulations and guidance to set the CoL Standard						
COBACK	at the time of occupancy. 2. Provide shade by structures at least 0.28 in accordance with 3. Provide shade with vegetate 4. Use paving materials with ar 5. Use an open-grid pavement 6. A minimum of 50% of the pro 7. Lighter reflective surfaces su 8. Provision of trees to provide 9. Self standing structures sucf	initial SR of at lest 0.33. ystem (at least 50 % unbound). jects site area shall be shade, vegetated and/or high solar reflectance surfaces. h as light-coloured coatings, membranes and pavement materials.	√ √ √	v	· v .		J	

Performance requirements

ю	Ю

eoualaja2 epino Wd M Guide (Projec	notiditost Description M Guide Task Description	Project Management	Building Surveying	Quantity Surveying	Architectural		taket Mechanical & Electrical Engineering	Fire Engineering	Interior Design Services	PassivHaus Design	Transportation	Contractor	
Task Bar	PPG Activities						carton	014010					
T Appointments	Prepare a list of primary and secondary Consultants. To complete and review the Schedule of services and scope of works reflects the Project requirements.	~			V	~	~		~			V	



#### dential nmercial (e.g., Offices) blic (e.g., Schools) only £250k - £5m £50m £50m gies lew build əfurb ted

act Mod

Car

my

Project Brief

				P Z	L S	ů	Re	ů	Рп	eq	£25	£51	Ab L		Cli Pro	
	Requir	rements	Performance requirements	As	set typ	pe		Clas	s		Va	lue		Interd	lependencies	PM
	Category / S	Sub-category	Performance standards and specifications from industry standards, regulations and guidance to set the CoL Standard													
GO BACK		Waste	<ol> <li>All efforts should be made to assist businesses and residents to reduce the amount of waste they produce and increase the proportion of waste they recycle.</li> <li>CoLC committed to improve recycling opportunites in flats as 99% of the square mile is flats, by improving recycling this can contribute to 32% recycling rate by 2025.</li> </ol>	v v	/ √	· √	~	· √	V	V	<ul> <li>1</li> </ul>	~	√		N/A	F
		Energy	<ol> <li>Efforts should be made (through training, monitoring energy consuption and commissioning building services) to ensure that post occuancy EPC A or BREEAM Excellent ratings are not affected by the tenants– also ensure than tenants get involved and play an active part in improving said ratings.</li> <li>Encouraging consumers to tariff switches such as the uptake of smart meters to help the widespread rollout of net zero technologies.</li> <li>Tackle fuel poverty by providing targeted energy efficiency measures and discounts on bills as highlighted within the Energy and Carbon Efficiency section.</li> </ol>	√ √	/ √		~	· √	~	J	<ul> <li>✓</li> </ul>	~	√ 、	/		With Co
	Community engagement	Travel/ Transport	1. Promote sustainable travel patterns & transport modes     2. Improve conditions for pedestrians and cyclists through better management of the facilities     3. All development proposals must be accompanied by an assessment of transport implications during construction & operation, focusing on:     -Road dangers     -Pedestrian environment and movement     -Oycling infrastructure provision     -Public transport     -The street network     oThis helps understand and mitigate the likely impact of the development on transport networks.     4. Loss of a pedestrian route will only be permitted where an alternative public pedestrian route of at least an equivalent standard is provided. Routes of historic     importance should be safeguarded.     5. Provide public access across private land where it enhances the connectivity, legibility and capacity of the City's street network.     6. Create new pedestrian rights of way where this would improve movement and contribute to the character of an area.     7. All off-street car parking spaces and servicing areas must be equipped with the facility to conveniently recharge electric vehicles.     8. Designated parking must be provided for Blue Badge holders within developments. For domestic buildings, motorcycle parking must be provided at a ratio of 10     motor cycle parking spaces per 1 car parking space whenever any car parking spaces are provided.	v v	/ J		J	. v	J		J	V	~		N/A	F
		Construction Impact	<ol> <li>Developers must consider minimising noise pollution arising from site acitivites. Where minimising is not possible, noise mitigation methods should be implemented e.g restricted operating hours, noise attention methods.</li> <li>Internal and external lighting should be designed to avoid spillage of light beyond what is needed to protect light-sensitive areas such as housing, hospitals, important areas of nature conservation.</li> <li>Where ground work is required, developers must carry out a detailed site investigation to establish site contamination and undertake a risk assessment. Remediating sources of contamination which present an unacceptable risk must be carried out.</li> </ol>	V v	/ √	√	1	√	1	V	√ √	~	~		N/A	F
GO BACK		Climate resilience	<ol> <li>Local communities must be encourged and involved in order to effectively reduce the vulnerability of their area against the impact of climate change.</li> <li>There should be active engagement with tenant and occupiers on resilience issues.</li> <li>Consideration should be given to mitigation of health impacts where overheating may be an issue.</li> <li>Development should aim to improve occupant's internal environment and comfort.</li> </ol>	v v	/ √		1	√	1		V	~	~		J	F
			<ol> <li>Smoke-free environment:</li> <li>Prohibited outdoor smoking at ground level within 7.5 meters of all building air intake.</li> <li>Signage is present to communicate the ban.</li> <li>Prohibited outdoor smoking on decks, patios, balconies, roof tops and other occupied outdoor area above ground level.</li> </ol>	√ √	/ √	√	~	√ √	$\checkmark$	V	√ √	~	~		N/A	Co

67 PM Guide (Project Delivery Methodology) Key Stakeholders Verify the objectives and priorities of the project. Ensure expectations are reasonable and attainable.Clarify client roles and the project structure. Gather contextual information.  $\checkmark$  $\checkmark$  $\checkmark$  $\checkmark$ 

Witness/testing & Commissioning Commissioning Commissioning Commissioning Ensure that appropriate key staff training has taken place. Verify the objectives and priorities of the project. Ensure expectations are reasonable and attainable.Clarify client roles and the project structure. Gather contextual information. Project Brief 1 Verify the objectives and priorities of the project. Ensure expectations are reasonable and attainable.Clarify client Project Brief  $\checkmark$  $\checkmark$ roles and the project structure. Gather contextual information. Contextual information. Verify the objectives and priorities of the project. Ensure expectations are reasonable and attainable.Clarify client roles and the project structure. Gather contextual information. Project Brief Concept Design DT to prepare a Scheme Design report on completion  $\checkmark$ √ √ √



GO BACK

GO BACK

				New build	Listed	Component replacement only Residential	Commercial (e.g., Offices)	Public (e.g., Schools) below £250k	£250k - £5m	E5m - £50m Above £50m	Technologies Whole Life Carbon	Climate Impact Modelling (resilience	Circular Economy	Procurement	PM Guide Reference	PM Guide Task Description	Project Management	Building Surveying Quantity Surveying	Architectural Structural and Civil Engineering	Mechanical & Electrical Engineering	Fire Engineering Interior Design Services	PassivHaus Design Transportation	Contractor
		rements Sub-category	Performance requirements Performance standards and specifications from industry standards, regulations and guidance to set the CoL Standard	А	set type		Class		Valu	e	Int	erdeper	dencies		PM Guide (Projec	t Delivery Methodology) PPG Activities			Key S	itakeholde	rs		
Эласк		Internal Environments	<ol> <li>Ventilation Design - complete one of the following: •Mechanically ventilated spaces •Newly installed ventilation systems are designed to meet one or more of 90% of the project area. oASHRAE 62.1-2010 or any more recent versions (Ventilation Rate Procedure or IAQ Procedure). oASHRAE 62.2-2012 or any more recent version. o CIBSE Guide A: Environmental Design, version 2007 or any more recent version. 2. Existing ventilation systems have been tested and balanced to meet supply and exhaust rates set in one or more ventilation guidelines listed above within the last five years. 3. Naturally ventilated spaces: •Newly installed ventilation systems are designed to meet one or more of 90% of the project area. oNatural Ventilation systems are designed to meet one or more of 90% of the project area. oNatural Ventilation procedure in ASHRAE 62.1-2010 or any more recent versions. eEN 16798-1. oCIBSE AM10: Natural Ventilation in non domestic buildings. oAS 1668.4-2012 or any more recent version. oASH fee eabove, which describes natural ventilation procedures. 4. Vents and windows used to meet the ventilation requirements in one of the standards mentioned above are permanently open or have controls to prevent their closure during periods of occupancy (openable windows not used in ventilation calculations may be user operated). 5. Outdoor air meets the following thresholds as an average for the previous year: •PM2.5 less than 30 µg/m³. e. Ventilation Monitoring: one of the following carbon dioxide thresholds in met in occupied spaces: •000 ppm or less. •000 ppm or less. •000 ppm above outdoor levels.</li> </ol>		/ √	~	J	~	J	√ √	~				Concept Design	DT to prepare a Scheme Design report on completion	¥			~			~
	WELL Building type requirements		Construction Pollution Management:  1. For construction occurring after enrolment or the start of subscription, the following requirements are met:  -Ducts are maintained per one of the below: Ducts are sealed and protected from possible contamination during construction. oDucts are estanded and protected from possible contamination during construction. eDucts are estanded prior to installing registers, grills and diffusers. 2. If permanently installed ventilation system is operating during construction, filters must meet the following: -Media filters with a PM10 removal rating of at least 70% (e.g., MERV 8) are used to filter return airAll filters are replaced prior to occupancyAll active areas of work are isolated from other spaces by sealed doorways or windows or using temporary barriersWalk-off mats are used at entryways to reduce the transfer of dirt and pollutantsSaws and similar tools use dust guards or collectors to capture generated dust.	1	1 J	1	1	J	1	J J		N/A	Å		Concept Design	DT to prepare a Scheme Design report on completion	~			V			1
BACK		Noise	<ol> <li>The following requirements are met:         <ul> <li>An annotated document is submitted and made available to occupants showing labelled zones throughout the project floor plan or similar schematic document as follows:             <ul> <li>oLoud zones: includes areas intended for loud equipment or activities (e.g. mechanical rooms, kitchens, fitness rooms, social spaces, recreational rooms, music rooms).</li> <li>oQuiet zones: includes areas intended for concentration, wellness, rest, study and/or privacy (e.g. restorative spaces, lactation rooms, nap rooms).</li> <li>oMixed zones: includes areas intended for learning, collaboration and/or presentation (e.g., auditoriums, classrooms, breakout spaces).</li> <li>oCirculation zones: includes occupiable areas not intended for regular occupancy (e.g. hallways, egress, atria, stairs, lobbies).</li> </ul> </li> <li>If Loud zones directly border Quiet zones, projects provide a plan for reprogramming or mitigating sound transmission between Loud zones and Quiet zones.</li> </ul> </li> </ol>	~	/ √	~	~	~	$\checkmark$	√ √		N/A	۸.		DT Appointments	Prepare a list of primary and secondary Consultants.	~			$\checkmark$			$\checkmark$
			Provide connection to nature: 1. The project integrates the following throughout the space, including common circulation routes, shared seatings, and rooms: •Natural Materials, patterns, shapes, colours, images or sounds. •One of the following: oPlants e.g. potted plants, planted walls OR oWater e.g. fountain.	1	/ √	~	~	J J	· √	1 1		N/A	A		Concept Design	DT to prepare a Scheme Design report on completion	$\checkmark$		√		~		~
		Mind	Provide connection to place: 1. The project integrates design elements that address the following: •Celebration of culture e.g. culture of occupants, workplace, surrounding communities. •Celebration of place e.g. local architecture, materials, flora, artists. •Integration of art. •Human delight.	1	1 1	√	~	J J	∕ √	√ √		N//	4		Concept Design	DT to prepare a Scheme Design report on completion	$\checkmark$		√		V	,	√



381		rements	Performance requirements	New build	Returb Listed sset type	Component replacement only	Residential Commercial (e.g., Offices) Public (e.g., Schools)	below £250k £250k - £5m	E5m - £50m Above £50m	Technologies	Whole Life Carbon Climate Impact Modelling (resilience	Circular Economy Procurement		uojtdusse Wethodology)	Project Management Building Surveying	Quantity Surveying Architectural	Structural and Civil Engineering Mechanical & Electrical Engineering	supplo Fire Engineering Interior Design Services	PassivHaus Design Transportation Contractor
	Category / \$	Sub-category	Performance standards and specifications from industry standards, regulations and guidance to set the CoL Standard Integrate universal design:	_		÷							Task Bar	PPG Activities					
GO BACK		Accessibility	<ol> <li>The project considers best practices in universal design to accommodate a diverse range of occupant abilities and needs throughout the project, by implementing at minimum one design, operations or policy strategy in each of the following categories:         <ul> <li>Physical access: entry, exit and key interaction points that enable inclusive entrance and strategies that enable flexible usability of the space to accommodate change as needed.</li> <li>Developmental and intellectual health: strategies that use colour, texture, images and other multi-sensory visually perceptible information (e.g. to accommodate sensory requirements of neurodiverse individuals).</li> <li>Wayfinding: strategies that help individuals intuitively navigate through the project (e.g. signage, tactile maps, symbols, auditory cues, information systems).</li> <li>Operations: operational policies and programs that support inclusion and accommodate a diverse range of needs (e.g. diversity and inclusion training, flexible work hours for individuals with disabilities).</li> <li>Technology: technology (e.g. audio and visual equipment, web access) that helps individuals fully utilise a space (e.g. to assist blind or deaf individuals, or those who do not speak the native language), made available to all occupants at no cost.</li> <li>Safety: strategies that support easy access to all spaces and amenities and minimize risk of injury, confusion or discomfort (e.g. lighting or clear sightlines to increase feelings of security).</li> </ul> </li> </ol>	~	J J		J J	V	J J		N/A		Concept Design	DT to prepare a Scheme Design report on completion	V	J	J	J	V
			Post Occupancy Evaluation (PO	E)															
	Embodied carbon	Embodied carbon	<ol> <li>Average carbon content of heat supplied (gCO_z/kwh per year) should be reported in-use.</li> <li>Reduce operational energy consumption to 35kWh/m² per year for small scale housing (energy use intensity in GLA).</li> </ol>	~	√ √	~	J J J	√ √	√ √	V	~	V	DT Appointments	QF170 Mechanical and Electrical Engineer's Services ScopeArrange a Kick-Off meeting with Primary Consultants.	√		V		~
	Operational energy and carbon	Post Occupancy performance	1. Carry out a post occupancy assessment to ensure that the design performance meets the in-use performance of the building.	$\checkmark$	√ √		J J J	x x	x x	$\checkmark$	$\checkmark$	√	Project Close-Out review	Compile lessons learned log	~				
		Energy Monitoring	<ol> <li>Appropriate energy monitoring and management systems are installed for the various end-use categories of energy consuming systems.</li> <li>Separate landlord and tenant energy use meters and clearly label meters with serial number and end use.</li> <li>Use a central repository for data that has a minimum of 18 months data storage.</li> </ol>	1	√ √	1	J J J	√ √	√ √	~			DT Appointments	QF170 Mechanical and Electrical Engineer's Services ScopeArrange a Kick-Off meeting with Primary Consultants.	~		~		✓ ✓
		Water Monitoring	1. Water-consuming plant or building areas, are either fitted with easily accessible pulsed or digital sub-meters or have water monitoring equipment integral to the plant or area.	√	√ √	~	J J J	√ √	√ √	~			DT Appointments	QF170 Mechanical and Electrical Engineer's Services ScopeArrange a Kick-Off meeting with Primary Consultants.	~		V		√ √
GOBACK	Energy and water monitoring	Data Disclosure	<ol> <li>Disclose energy use data (residential) including:</li> <li>Collect annual building energy consumption and generation.</li> <li>Aggregate average operational reporting e.g. by post code for anonymity or upstream meters.</li> <li>Collect water consumption meter readings.</li> <li>Upload five years of data to GLA and/or CarbonBuzz online platform.</li> <li>Consider uploading to Low Energy Building Database.</li> </ol>	V	√ √		√	~	√ √	~			vvitness, testing	Ensure the Building Service Engineer and other specialist are in attendance to witness testing & commissioning.	√ √		V		√ √
			<ol> <li>Disclose energy use data (commercial / Public) including:</li> <li>Carry out an annual Display Energy Certificate (DEC) and include as part of annual reporting.</li> <li>Report energy consumption by fuel type and respective benchmarks from the DEC technical table.</li> <li>For multi-let commercial offices produce annual landlord energy (base building) rating and tenant ratings as well as or instead of a whole building DEC.</li> <li>Upload five years of data to a publicly accessible database such as GLA and/or CarbonBuzz.</li> </ol>	~	√ √		J J	~	√ √	~				Ensure the Building Service Engineer and other specialist are in attendance to witness testing & commissioning.	√ √		V		J J
	Local air quality	Local air quality	1. Monitor the following at least once a year: +PM2.5. +PM10. 2. One of the following: •Total VOC. Benzene, Formaldehyde, Toluene. •Carbon Monoxide. •Ozone.	V	J J		√ √			1			DT Appointments	Prepare a list of primary and secondary Consultants.	1		J		4



	New build	Refurb	Listed	Component replacement only	Commercial	Residential	Public	below £250k	£250k - £5m	£5m - £50m	Above £5m	Technologies	Whole Life Carbon	Climate Impact Modelling (resilience)	Circular Economy	Procurement	Project Management	Building Surveying	Quantity Surveying	Architectural	Structural and Civil Engineering	Mechanical & Electrical Engineering	Fire Engineering	Interior Design Services	PassivHaus Design	Transportation	Contractor
	Asse	t type	/ Clas	ss / Va	lue							ı	nterd	epenc	lencie	es	Stake	eholde	rs								
																	Key s lifecy	stakeł /cle w	iolder ho wi	s to b Il inpu	ie con ut intc	sidere desi	ed thr gn and	ougho d cons	out pr tructi	oject on	
ince	V	V	V		V	~	V		V	V	V			N/A			J		V	V	V	V		V	V	V	~
		V			V				V	√	V			N/A			V	v	V	V	V	V		V	V	V	~
		V	V		V				V	~	V			N/A			V	v	V	V	V	V		√	~	~	~
	V					~			V	~	V			N/A			V		V	V	V	~		~	~	~	~

	Торіс	Information requirements - Assurance	Information requirements - KPI's	ping anya gunja Asset type /	Listed Component replacement only Class / Asine	Residential Public	below £250k £250k ESm £5m - £50m	Technologies Whole Life Carbon Climate Impact Modelling (resilience) Circular Economy Procurement	Project Management Building Surveying	a Quantity Surveying Architectural	Architecturar Structural and Civil Engineering Mechanical & Electrical Engineering	Fire Engineering	Interior Design Services PassivHaus Design	Transportation Contractor
	Category / Sub-category	A list of data which suppliers need to gather to demonstrate compliance with the nz standards and	A list of data which suppliers need to gather to demonstrate compliance with CoL KPIs (templates will be produced at a later date)								be consid			
		guidance (templates will be produced at a later date)						_	lifecycle wł	no will in	iput into de	sign and c	onstructio	bn
	Introduction and Accreditations													
GO BACK		BREEAM Pre-assessment document	Planning requirements: led to 75% of new commercial developments with over 20,000m ² floor space achieving at least a BREEAM 'Excellent' rating since 2014.											
		Confirmation of BRE Registration and Assessment number	Embed sustainability principles into the design of all refurbishments and new build projects.	J J .		√ √	J J ,	N/A	4			,	1 .1	1 1
		Interim (Design) Stage Assessment Report and compliant evidence		vv	· ·	vv	_ ` ` ` `	IV/A	Ť	~ ~	vv		• •	v v
		Final (Post Construction Review) Assessment Report and compliant evidence	Increase engagement and communications about sustainability with residents, businesses, visitors and other stakeholders.											
		Complete SKA informal self- assessment of the environmental performance of fit-out	Embed sustainability principles into the design of all refurbishments and new build projects.											
		Commission a quality-assured assessment and certificate from a RICS-accredited SKA assessor	Increase engagement and communications about sustainability with residents, businesses, visitors and other stakeholders.						✓ ✓					
		Obtain clear guidance on good practice in fit-out and how to implement it		$\checkmark$	~		$\checkmark$ $\checkmark$ $\checkmark$	N/A	$\checkmark$ $\checkmark$	~ ~	/		$\checkmark$ $\checkmark$	$\checkmark$ $\checkmark$
		Benchmark the performance of fit-out against other similar buildings and Industry												
	Sustainability rating	Accredited NABERS Energy for Offices rating	Embed sustainability principles into the design of all refurbishments and new build projects.											
				√	√ √		✓ ✓ ·	N/A	√ √	√ √	/	,	√ √	✓ ✓
		Validation Record Template completed	Increase engagement and communications about sustainability with residents, businesses, visitors and other stakeholders.											
		Simulation Report												
		Home Quality Mark (HQM) Pre-assessment document	Embed sustainability principles into the design of all refurbishments and new build projects.											
go back		Confirmation of HQM Registration and Assessment number	Increase engagement and communications about sustainability with residents, businesses, visitors and other stakeholders.	1		~	√ √ ·	N/A	~	√ √	/	,	√ √	✓ ✓
		Interim (Design) Stage Assessment Report and compliant evidence												
		Final (Post Construction Review) Assessment Report and compliant evidence												



<b>Topic</b> Category / Sub-category Introduction and Accreditations	Information requirements - Assurance A list of data which suppliers need to gather to demonstrate compliance with the nz standards and guidance (templates will be produced at a later date)	Information requirements - KPI's A list of data which suppliers need to gather to demonstrate compliance with CoL KPIs (templates will be produced at a later date)	View build New build Befurb Listed Component replacement only	Commercial	Residential Public	below £250k £250k	E5m - E50m Above E5m	Technologies Whole Life Carbon	Climate Impact Modelling (resilience) Circular Economy Procurement		ders Architectual Architectual			Contractor
Whole life carbon	Life cycle assessment - materials													
Embodied carbon	EPD Certificates Energy Assessment - report average carbon content of heat supplied (gCO ₂ /kwh per year)	No CAS KPIs	J J J J	·	/ √	√ √	√ √	√ √	$\checkmark$	~	~	√ √		~
Whole life cycle carbon assessment	Confirmation of Whole life Carbon Calculations. Optimisation measures with costings	Support the integration of whole life carbon and cost analysis. Scope 3 Capital Projects Emissions	~ ~ ~ ~	· • •	/ √	√ √	J J	J J	V	V	V			
	Energy Strategy report to detail EUI and space heating demand	Maximise the use of renewable energy sources across our operational buildings. Energy consumption kWh/m ² floor area	J J J	~ ~	<ul> <li>✓</li> </ul>	V	√ √	V				V		
Operational carbon and energy + LZC Technology	As designed BRUKL - output from energy modelling providing design energy results Energy Modelling using appropriate software Permeability / air test results showing air tightness figure	Part L modelling - Further details can be seen in the Technical Standard Energy consumption kwh/m2 floor area	J J J	√ √	<ul> <li>✓</li> </ul>	V	√ √	V				V		
	As built BRUKL - output from energy modelling providing as built / post construction results Permeability / air test results showing air tightness figure	Energy consumption kWh/m ² floor area	√ √ √	√ √	<ul> <li>✓</li> </ul>	$\checkmark$	√ √	V				V		
	Post Construction Evaluation report showing post occupancy evaluation (POE) requirements (and results where completed)	No CAS KPIS	√ √ √	√ √	/ √	√ √	√ √	~		~				
	LZC Technology feasibility study	Develop a Square Mile renewable energy strategy	√ √ √	√ √	/ /	√ √	√ √	$\checkmark$		√	√	~	1	~
	Carbon Reduction Net zero strategy with energy modelling Confirmation of climate action fund Whole life carbon calculations Carbon removals strategy	Accelerate the move to net zero carbon and energy efficient tenanted buildings, working closely with tenants to achieve shared goals	✓ ✓ ✓	√ √	/ ✓	√ √	√ √	J J	√ √	~	V	J	~	~
Minimising Carbon	Minimise Pollution Low Zero Carbon Technology options	Maximise the use of renewable energy sources across our operational buildings	✓ ✓ ✓ ✓	·	/ /	√ √	√ √	√ √	√ √	$\checkmark$	~	$\checkmark$	✓	$\checkmark$
	Energy Efficiency Thermal comfort Modelling	Accelerate the move to net zero carbon and energy efficient tenanted buildings, working closely with tenants to achieve shared goals Reduce pollution and increase the resilience of the Square Mile. Reduce air pollution through implementing our ambitious air quality and transport strategies.	√ √	~ ~	/ √	√ √	J J	J J	√ √	~	V	V	~	~



	New build	Refurb	Listed	Component replacement only	Commercial	Residential	Public	below £250k	£250k - £5m	£5m - £50m	Above £5m	Technologies	Whole Life Carbon	Climate Impact Modelling (resilience)	Circular Economy	Procurement	Project Management	Building Surveying	Quantity Surveying	Architectural	Structural and Civil Engineering	Mechanical & Electrical Engineering	Fire Engineering	Interior Design Services	PassivHaus Design	Transportation	Contractor
	Asset	type	/ Cla	ss / Va	lue							'	nterd	lepen	dencie	es	Stake	holde	rs								
																	Key s lifecy										
1																											
	~	~	~	$\checkmark$	~	~	~		~	~	~		~		~		~			~	~			~			~
1																											
	√	√	√	~	√	√	~	~	~	√	~		~		√	~	~			~							~
ı	~	√	~	√	√	√	√	√	√	~	√		~		~	~	~			√							√

			New build Refurb	Listed	Component replacement only	Commercial Residential	Public below £250k	£250k - £5m £5m - £50m	Above £5m	Technologies Whole Life Carbon	Limate impact Modelling (resultence) Circular Economy	Procurement	Project Management Building Surveying	Quantity Surveying	Architectural Structural and Civil Engineering	Mechanical & Electrical Engineering Fire Engineering	Interior Design Services	PassiVHaus Design Transportation
Торіс	Information requirements - Assurance	Information requirements - KPI's	Asset typ	oe / Class	s / Value					Interder	endencies	s	stakeholde	rs				
Category / Sub-category	A list of data which suppliers need to gather to demonstrate compliance with the nz standards and guidance (templates will be produced at a later date)	A list of data which suppliers need to gather to demonstrate compliance with CoL KPIs (templates will be produced at a later date)													o be consi nput into c			
Introduction and Accreditations																		
Circular Economy																		
Decommissioning	Circular Economy Statement. Functional adaptability Strategy	Support the integration of circular economy principles into day-to-day activities of the Corporation. Embed circular economy principles into our capital projects and reduce carbon intensity by using life cycle carbon and cost assessment techniques and design specifications. Use our planning role to influence others to embed carbon analysis and circular economy principles in capital projects through use of the Supplementary Planning Document - Planning for Sustainability. Embrace circular economy principles across our strategies and work.	J J	· √	√ √	/ ✓	~	√ √	√	V	V		~	,	/ ✓		V	
Circular economy	Circular Economy Statement.	Support the integration of circular economy principles into day-to-day activities of the Corporation. Embed circular economy principles into our capital projects and reduce carbon intensity by using life cycle carbon and cost assessment techniques and design specifications. Use our planning role to influence others to embed carbon analysis and circular economy principles in capital projects through use of the Supplementary Planning Document - Planning for Sustainability. Embrace circular economy principles across our strategies and work.	√ √	· J	√ √	/ J	1 1	√ √	J.	V	V	√	✓		/			
Resource efficiency	Circular Economy Statement. Site Waste Management Plan.	Support the integration of circular economy principles into day-to-day activities of the Corporation. Embed circular economy principles into our capital projects and reduce carbon intensity by using life cycle carbon and cost assessment techniques and design specifications. Use our planning role to influence others to embed carbon analysis and circular economy principles in capital projects through use of the Supplementary Planning Document - Planning for Sustainability. Support the integration of low impact materials	J J	- J	√ √	/ √	J J	√ √	√	J	V	J	√		/			



New build	Refurb	Listed	Component replacement only	Commercial	Residential	Public	below £250k	£250k - £5m	£5m - £50m	Above £5m	Technologies	Whole Life Carbon	Climate Impact Modelling (resilience)	Circular Economy	Procurement	Project Management	Building Surveying	Quantity Surveying	Architectural	Structural and Civil Engineering	Mechanical & Electrical Engineering	Fire Engineering	Interior Design Services	PassivHaus Design	Transportation	Contractor
Asset	t type	/ Clas	ss / Va	lue							1	nterd	epend	dencie	25	Stake	holde	rs								
																						ed thro gn and				
~	~	~		~	√	~	~	~	~	~				~	~	~			√	~			~			~
V	√	V	1	V	V	V	V	V	V	V				V	V	V	V									~
$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	√	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$				$\checkmark$		~	$\checkmark$		$\checkmark$	$\checkmark$	$\checkmark$		$\checkmark$			
$\checkmark$				$\checkmark$	√	$\checkmark$		$\checkmark$	$\checkmark$	$\checkmark$		$\checkmark$		$\checkmark$	$\checkmark$	~			$\checkmark$	$\checkmark$						$\checkmark$

			New build Refurb Listed Component replacement only Commercial Rusidential Public E250k £250k £250k £250k £5m £5m £5m £5m	Technologies Whole Life Carbon Climate Impact Modelling (resilience) Circular Economy Procurement	Project Management Building Surveying Quantity Surveying Architectural Structural and Civil Engineering Mechanical & Electrical Engineering Fire Engineering Fire Engineering PassivHaus Design Transportation Contractor
Торіс	Information requirements - Assurance	Information requirements - KPI's	Asset type / Class / Value	Interdependencies	Stakeholders
Category / Sub-category	A list of data which suppliers need to gather to demonstrate compliance with the nz standards and guidance (templates will be produced at a later date)	A list of data which suppliers need to gather to demonstrate compliance with CoL KPIs (templates will be produced at a later date)			Key stakeholders to be considered throughout project lifecycle who will input into design and construction
Introduction and Accreditations					
Materials					
Low impact materials	Materials Management Plan Site waste management plan Responsible sourcing certificates	Support the integration of low impact materials	~ ~ ~ ~ <b>~</b> ~ <b>~</b> ~ ~ ~ ~	√ √	✓ ✓ ✓ ✓ ✓
Procurement of materials	Bill of Materials Circular Economy Statements Follow CoLC Procurement Code	Support the integration of low impact materials. Strengthen our requirements and supplier engagement to drive performance and innovation in delivering sustainable products and solutions. Support organisations in the Square Mile to build circular, low carbon and resilient supply chains. Promote responsible procurement and investment practices.	~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~		
Material durability	Development of material durability optioneering throughout RIBA stages	Support the integration of low impact / highly durable materials.		$\checkmark$	v v v v v v
Modern methods of construction	Development of modern methods of construction optioneering throughout RIBA stages	Support the integration of low impact materials	J J J J J J J	√ √ √	✓ ✓ ✓ ✓



New build	Refurb	Listed	Component replacement only	Commercial	Residential	Public	below £250k	£250k - £5m	£5m - £50m	Above £5m	Technologies	Whole Life Carbon	Climate Impact Modelling (resilience)	Circular Economy	Procurement	Project Management	Building Surveying	Quantity Surveying	Architectural	Structural and Civil Engineering	Mechanical & Electrical Engineering	Fire Engineering	Interior Design Services	PassivHaus Design	Transportation	Contractor
Asset	t type	/ Clas	s / Va	lue		_	_				'	nterd	lepen	denci	25		holde takeh	_	s to h	e con	sider	ed thr	nughr	nut nr	oiect	
																						gn and				
V	~	V	V	~	~	V	~	V	V	V	V		V			~	V	V	V	~	V					~
V	V	√		J	V	√	V	√	√	√			V			V	V	V	V							✓

			New build Refurb Listed Component replacement only commercial Residential Below 2250k E250k E5m E250k E5m Above E5m Above E5m Technologies	Climate impact Modelling (resilience) Circular Economy Procurement	Project Management Building Surveying Quantity Surveying Architectural Architectural Architectural and Civil Engineering Structural and Civil Engineering Mechanical & Electrical Engineering Fire Engineering Interior Design Services PassivHaus Design Transportation Contractor
Торіс	Information requirements - Assurance	Information requirements - KPI's	Asset type / Class / Value Interd	lependencies	Stakeholders
Category / Sub-category	A list of data which suppliers need to gather to demonstrate compliance with the nz standards and guidance (templates will be produced at a later date)	A list of data which suppliers need to gather to demonstrate compliance with CoL KPIs (templates will be produced at a later date)			Key stakeholders to be considered throughout project lifecycle who will input into design and construction
Introduction and Accreditations					
Resilience					
Climate change adaptation	Asset identification Sustainability Statements Risk Assessment and risk workshop Confirmation of intervention measures designed in and installed / implemented (drawings, specifications, photographs, etc.) Flood Risk Assessment	Embed resilience measures into our upgrade plans for our owned and operated buildings. Embed a climate resilience lens into all our decision-making. Make the Square Mile public realm more climate change ready through adding in more green spaces, urban greening, flood resistant road surfaces, adaptable planting regimes and heat resistant materials. Strengthen our planning guidance on climate resilience measures for new developments.	~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~	V	~ ~ ~ ~ ~ ~ ~ ~ ~
BACK	BREEAM Evidence requirements: One or more of the appropriate evidence types listed in the BREEAM Evidential requirements such as Design drawings and professional specialist reports	Introduce new land management practices across our open spaces aiming to maximise their ability to remove carbon, and optimise their biodiversity and resilience value. Advocate the importance of green spaces and urban greening as natural carbon sinks, and their contribution to biodiversity and overall wellbeing.			
Biodiversity, ecology and conservation	Completed BREEAM and HQM Ecology Risk Evaluation Checklist	Make the Square Mile public realm more climate change ready through adding in more green spaces, urban greening, flood resistant road surfaces, adaptable planting regimes and heat resistant materials.	J J J J J J J J J	✓	J J J J J
	A copy of the Ecological Survey and Evaluation document such as a Phase 1 habitat assessment. Site visits confirming measures have been carried out in-practice in line with SQEs recommendations As-built evidence to show the changes in the BREEAM Change in Ecological value calculator have been carrie out as planned in line with SQEs recommendations e.g. as built drawings, photos, SQE sign off.	Enhance greening and biodiversity across our public realm and open spaces.			



New build	Refurb	Listed	Component replacement only	Commercial	Residential	Public	below £250k	£250k - £5m	£5m - £50m	Above £5m	Technologies	Whole Life Carbon	Climate Impact Modelling (resilience)	Circular Economy	Procurement	Project Management	Building Surveying	Quantity Surveying	Architectural	Structural and Civil Engineering	Mechanical & Electrical Engineering	Fire Engineering	Interior Design Services	PassivHaus Design	Transportation	Contractor
Asse	t type	/ Clas	ss / Va	ilue								interd	lepen	denci	es		takeł	older					ougha d cons			
V	√	V		~	V	V	~	√	V	V			V			V			V	V	V					~
V	~	~		~	~	~	~	~	~	~	~	~				~			~		~		~		~	~
V				~	√	V					~		V			√	~		V		√			V		√

				New build Refurb Listed	usted Component replacement only	Commercial Residential Public	belov £250k £250k - £5m	£5m - £50m Above £5m	Technologies Whole Life Carbon	Climate Impact Modelling (resilience) Circular Economy Procurement	Project Management	Building Surveying Quantity Surveying	Architectural Structural and Civil Engineering	Mechanical & Electrical Engineering Fire Engineering	Interior Design Services PassivHaus Design	Transportation Contractor
Topic	c	Information requirements - Assurance	Information requirements - KPI's	Asset type / C	Class / Value				Interde	ependencies	Stakeho	olders				
Categ	gory / Sub-category	A list of data which suppliers need to gather to demonstrate compliance with the nz standards and guidance (templates will be produced at a later date)	A list of data which suppliers need to gather to demonstrate compliance with CoL KPIs (templates will be produced at a later date)												ughout proj constructio	
Introd	duction and Accreditations															
Flood	l resilience	Flood Risk Report Climate Change Adaptation Strategy	Embed resilience measures into our upgrade plans for our owned and operated buildings. Embed a climate resilience lens into all our decision-making. Make the Square Mile public realm more climate change ready through adding in more green spaces, urban greening, flood resistant road surfaces, adaptable planting regimes and heat resistant materials. Reduce the risk of flooding through developing sustainable rain and surface water management policies, resulting in a connected system of water recycling, sustainable urban draining and rainwater management measures.	J J J	<i>x</i> .	1 1 1	J J	√ √		V	J		J J	√		
Local a	air quality	Transport Assessment and Travel Plan Marked up drawing showing cyclist facilities locations and details. Confirmation including a formal commitment with targets set and tables / systems of monitoring and reporting energy and CO ₂ from site activities and transportation of materials and waste. Confirmation of heating and hot water source / plant including specifications, drawings and manufacturers datasheets. Must show type, NOx emissions, VOCs and PM10 levels. Manufacturers datasheets / confirmations of VOC and formaldehyde and carcinogen levels of all finishes materials. Air Quality Assessment Environmental Impact Assessment Screening Matrix checklist Confirmation of the installation of air quality monitoring tools Site specific indoor air quality plan Results from post construction on site VOC and formaldehyde testing.	Facilitate collaborative action on air pollution in London. Reduce air pollution through implementing our ambitious air quality and transport strategies.	√ √ √	<i>,</i> .	/ / /	✓ ✓	J J	✓ ✓		~		~	~	V	V
Passiv	ve design	Passive design solutions integrated into the design development by the Architect Passivhaus solutions integrated into the design development by the Architect Energy modelling and reporting	Embed passive design and resilience measures into our upgrade plans for our owned and operated buildings. Make the Square Mile public realm more climate change ready through integrating passive solutions, adding in more green spaces, urban greening, flood resistant road surfaces, adaptable planting regimes and heat resistant materials.	V		x			V	~	✓	V	√	✓	~	



	Topic Category / Sub-category Introduction and Accreditations Wellbeing		Information requirements - KPI's A list of data which suppliers need to gather to demonstrate compliance with CoL KPIs (templates will be produced at a later date)	Vew build Refurb Listed Component replacement only	Commercial Residential	Public below 2250k £250k - E5m £5m - E5m	Above E5m Technologies Wuhola Life Carbon	Circular Economy Procurement		eholders			Interior Design Services PassivHaus Design Transportation Contractor
GO BACK	Community centric approach	Waste reduction techniques and initiatives Energy monitoring systems and commissioning reports BREEAM In Use Assessment (optional) Assessment of transport implications Contractor pollution control methods and policies, including minimising light pollution Site investigation with risk assessment and remediation strategy Climate resilient techniques	Upskill our workforce on net zero. Upskill our workforce on climate resilience. Upskill our workforce on Circular Economy approaches. Share best practice on standards, tools, platforms and expertise to facilitate green and sustainable investment and growth. Encourage global movement towards disclosure and production of credible transition plans as the norm. Foster an ambition to achieve net zero emissions by 2050 or sooner for UK-based financial and professional services firms. Join other investors working through development and implementation of net zero transition action plans. Support financial institutions committing to net zero in the 2040s at the latest, covering all emissions, including scope 3 and where data allows reliable measurement. Support charities and SMEs to consider, prepare for and lead the response to climate change. Share learning and best practice about the challenges and opportunities of our net zero journey. Address existing inequalities and ensure no one is left behind. Prepare people for skills needed in a net zero economy. Facilitate collaborative action on air pollution in London. Work with our creative and educational sector partners to deliver sustainable initiatives.	J J J J	J J	v v v v	✓ ✓	~	V		✓	✓	√ √
	WELL type requirements (noise, air quality, accessibility, etc.)	Air quality monitoring regime and testing results by Air Quality Consultant. Marked up drawings / photographs showing smoke free areas and signage, along with smoke free policies agreed and adhered to. M&E drawings, specifications, datasheets confirming ventilation strategy and monitoring, testing results, and confirmation of relevant / applicable standards met. Contractor confirmation of (as applicable): - sealed and protected ducts, and cleaning regime / confirmation completed - replacement of filters, and media filters with a PM10 removal rating - moisture and dust management procedures Marked up drawing / schematic showing labelled noise zones. Marked up drawings / specifications / photos showing internal spaces with natural materials and planting or water fountain. Confirmation / evidence of meeting the 'connection to place' requirements. Confirmation of universal design / accessibility including in design, policy and operations using drawings, specifications, photos, etc.	Advocate the importance of green spaces and urban greening as natural carbon sinks, and their contribution to biodiversity and overall wellbeing	~ ~ ~ ~	J J	✓ ✓ ✓ ✓	J J		J		~	√ ,	1 1



Schematics, drawings, specifications confirming metering strategy, along with the monitoring and management systems.

Confirmation of energy use data disclosure, reporting strategy.

Confirmation of data upload to Carbon Buzz or GLA.

Copy of DEC

Information requirements - KPI's

No CAS KPIs

Information requirements - Assurance



## GO BACK

(POE)

Post Occupancy Evaluation

Energy and Water Monitoring



V			£250k - £5m
V			£5m - £50m
			A harve of the
~			Above £5m
V		I	Technologies
		nterd	Whole Life Carbon
		lepend	Climate Impact Modelling (resilience)
		denci	Circular Economy
		es	Procurement
V		Stake	Project Management
		holde	Building Surveying
		rs	Quantity Surveying
	s to b Il inpu		Architectural
			Structural and Civil Engineering
V			Mechanical & Electrical Engineering
			Fire Engineering
			Interior Design Services
			PassivHaus Design
			Transportation
~			Contractor

This section summarises the monitoring and reporting requirements for Project Managers applying the Net Zero Design Standard and the principal project data interfaces with other associated CoLC documents and processes.

The **Design Standard 'Tracker'** is intended to assist the CoLC PM in monitoring and reporting on a project's performance against the Project, Process and Information requirements of the Standard.

The Best Available Technology (BAT) Guidance sets out the activities to be applied by Project Managers to identify and evidence the selection of **Best Available Technology (BAT)** for CoLC projects across the RIBA stages. The Best Available Technology (BAT) Tool is designed to be used by the Project Manager to demonstrate compliance with the requirements given in the Standard's Performance and Technical tables.

The CoLC Whole Life Carbon Methodology and WLC Assessment Template can be applied to record WLC on projects to support net zero targets, improve resilience and inform future building resilience action plans. The emissions data captured in the assessment can be used to evidence contribution to the relative CAS KPIs.

Resilience interventions that have been identified and applied for the priority assets (undertaking refurbishments) must be managed in collaboration with the Asset Managers and recorded in the Buildings Resilience Plan, taking this approach will ensure that contribution to the Resilient Buildings KPIs is consistent.

As noted above (**>How to Use this Standard**), the Net Zero Standard provides users with an overview of and access to other CoLC tools to embed sustainability across CoLC assets.

## Monitoring

The **Net Zero Design Tracker** provides a consistent approach for the PM to monitor project requirements and maintain a record of the project's status against these. To support the successful

completion of the Tracker, the PM should create and maintain a Net Zero Design Standard folder in the Project File to collate all the requisite information to show compliance with the Standard. It is recommended that the PM communicates to the Project Delivery Team and other relevant stakeholders e.g., Commercial Services what information is required to be retained and when, responsibilities for collating information and to provide access to the project file.

#### **Lessons Learnt**

Throughout the project, the PM should discuss with the Project Delivery Team opportunities to improve, and lessons learnt. This should be captured in the Design Standard Tracker Comments column for each RIBA stage, so that all lessons learnt can be easily extracted at any stage within the project and shared within the organisation to inform and enhance project delivery and accelerate delivery of the Climate Action Strategy targets

## **Filing Structure**

This Project file should be used to store / collate copies of the supporting evidence (as summarised in the Tracker's Evidence column) throughout project delivery. The file should be structured with folders aligned with the RIBA project delivery stages and / or CoLC Gateways.

The Project file should also be used to maintain records of:

- Best Available Technology Assessments and the Project Manager's explanation if / where this is not considered applicable to a given project.
- The Monitoring Performance Approach.
- The associated data requirements to confirm that the technology meets the performance requirements of the BAT Assessment; and
- Monitoring and collection of operational data to confirm that the BAT performance standards have been met.

The project's Net Zero Design Standard folder should be held in SharePoint so that it is available for review by the CoLC Senior Officer at the end of each RIBA Stage and or CoLC Gateway or as required.

Whole Life Carbon Assessment, Climate Impact Modelling and Resilience monitoring data requirements significantly overlap with those for the Net Zero Standard and hence, the PM is expected to find it beneficial to maintain records all the supporting information within the Project File.

#### **Relevant Gateway Approvals**

Gateway 1 - Project Briefing

Gateway 2 - Project Proposal

#### Gateway 3 - Options Appraisal

#### Gateway 4 - Detailed Options Appraisal

- a. Inclusion in capital programme
- b. Approval of the Court of Common Council
- c. Detailed Design

Gateway 5 - Authority to start work

Gateway 6 - Outcome report

## Reporting

The use of the Net Zero Design Standard is mandatory for all projects, and it is recommended that where possible the requirements should be implemented on projects. However, it is not currently mandatory to comply with all categories or requirements of the Standard.

It is recognised that full compliance may not always be practical or possible. It is accepted that larger projects (with capital value over a defined financial value) will be able to achieve greater compliance with this standard than smaller projects, but it is expected that the standard is applied in such a way that provision is made for authorised deviations from the requirements of the Standard. PMs are expected to keep justification for such deviations as part of the project file to be detailed as necessary in gateway reporting or for audit review.

CoLC will establish procedures for review and confirmation of compliance with the requirements of the Standard. It is recommended that the Net Zero Design Tracker and supporting files are reviewed by the City of London Senior Officer on a structured basis to confirm compliance with the requirements of the Standard throughout project delivery. It is suggested that review and sign-off should be obtained as soon as is practical following the end of each RIBA stage / Gateway.

This element is Work in Progress / awaiting input from the CoLC.

### **Continuous Improvement**

Application of the Design Standard will generate data on the energy and carbon performance of CoLC buildings and projects. It is anticipated that over time, review and analysis of this data set will support the identification of 'better performing' approaches and projects and that this information will then inform refinement of the Standard to help drive further improvement and ultimately reduction in the CoLC's climate change risk profile. The PM has a key role to play in generating and collating project-specific information for the Design Standard, Climate Impact Modelling and understanding of CoLC asset Resilience.

**CACCESS & Download Net Zero Tracker here** 

04. Standard Requirements

The guide is owned by the CoLC Property Projects Group and questions should be directed to the Property Projects Team.

For subject matter experts queries please contact the following:

- Head of Energy and Sustainability Energy
   and Sustainability
- Climate Action Programme Director Climate
   Action Programme
- **Property Projects Director** Property projects
- Director Building Surveying Operational
   Property Operational property
- Environmental Resilience Officer Resilience
- Senior Energy Engineer Energy
- Principal Planning Officer Planning
- Responsible Procurement Manager –
   Commercial Services



## // Building Blocks for Net Zero

Appendix 1 - Net Zero Technology Guide

## Introduction

The Technology Guide (Performance Standards and Technical Standards) is provided to support the wider Net Zero Design Standard and provide further details on the application of technologies to support with the transition to net zero carbon. This Appendix provides information on performance and technical implementation of specific building technologies, and the best available technology in the design, major refurbishment, and replacement activities across the CoLC estate.

The Technology Guide is divided into ten main Technology Categories which are then further split into Sub-Categories. Each category and sub-category is divided into an introduction, and into two further sections providing information on Performance Standards and a Technical Standards for implementation of specific building technologies across the estate. Guidance is also provided at the end of the Section on choosing the Best Available Technology to lead to the most appropriate net zero solution and providing evidence of this selection process.

The Sections below introduce the Categories and Sub-Categories, providing an overview of the technology and the Sub-Categories. As technology choices will vary between building and project types, information is provided in the category introductions as a starting point to support optioneering between technology sub-categories.

Although the Technology Guide is divided into technology categories, it is important, where feasible and appropriate, to take a whole system approach which considers the interplay between technologies in the overall design of the project. Within the technology introductions, information is provided on the interdependencies between the technology categories to provide initial guidance in this area. For new construction or where a range of services and fabric are being refurbished a detailed whole building assessment should be undertaken, which may involve building modelling and assessments by the design team.

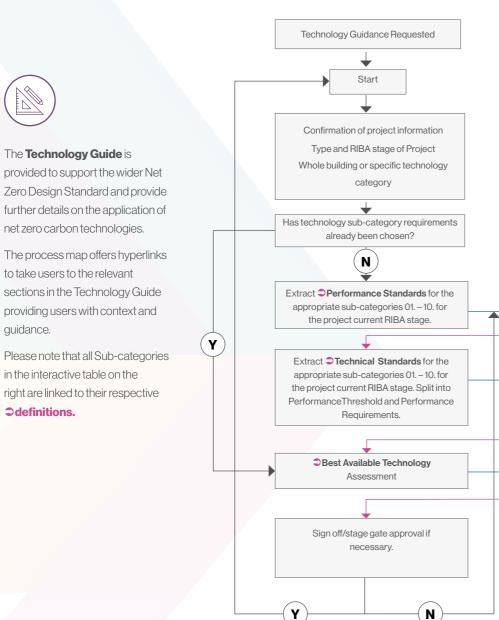
Detailed references are provided to support the performance standards and technical guidance, these references allow for further detailed research information to be easily accessed. By reviewing these references, the regular update and maintenance of this information can also be supported.

### Interactive User Guide & Structure

The Interactive User Guide allows users to navigate through this Technology Standard to find relevant Performance and Technical tables of requirements which contain detailed information that will support net zero technology decision making. The information is split into the ten categories and subcategories and can be searched using the hyperlinks in the table on the next page.

#### Appendix 1: Net Zero Technology Guide

guidance.



START			
	<b>↓</b>	Technical	↓ BAT
01. Fabric	Performance	Technical	BAI
Wall Insulation	-	•	•
Roof insulation	-	•	•
Windows and Doors	-	•	•
Floorinsulation	-	•	•
Draught-proofing	-	•	•
02. Heating			
Heat pumps		•	•
Boilers (Gas / Electric)	-	•	•
Electric Convectors	-	•	•
Radiant heaters	-	•	•
District heating	-	•	•
03. Future Heating			
Hydrogen		•	•
Blended Natural Gas	-	•	•
Low Carbon CHP	-	•	•
04. Hot Water			
Centralised System	-	•	•
Point of Use	-	•	•
Solar hot water	-	•	•
05. Cooling			
Air cooled chillers	-	•	•
Water Cooled chillers	-	•	•
Cooling Towers	-	•	•

	Performance	Technical	BAT
05. Cooling continued			
DX spit unit systems	-	•	•
Variable Refrigerant Flow (VRF)		•	•
Hybrid VRF	-	•	•
06. Ventilation			
Air Handling/Mechanical ventilation	-	•	•
Extract only ventilation	-	•	•
Heat Recovery	-	•	•
Ground sourced air heat exchanger		•	•
Dehumidification	-	•	•
07. Electric Power			
Power Factor Correction	-	•	•
EV charging	-	•	•
Lighting	-	•	•
08. Controls			
BMS		•	•
Metering	-	•	•
09. Renewables			
Solar PV	-	•	•
Solar thermal	-	•	•
Battery storage	-	•	•
10. Components			
Pumps	-	•	•
Fans	-	•	•
Refrigerants	-	•	•
Water quality	-	٠	•

RETURN

### **Performance Standards:**

The Performance Standard provides recommended threshold performance to support identification and specification of efficient and low carbon technologies and components. These Performance Standards are split into two main categories:

- **Performance Thresholds:** These standards provide the minimum performance standards that would be expected for a project. These are mainly based on Part L of the Building Regulations Guidance.
- **Performance Requirement:** Further guidance on higher performance standards than minimum thresholds that it is recommended to deliver to ensure the project moves towards or achieves net zero design.

These minimum performance standards and requirements have been developed from a literature review of existing regulations, policy, industry standards, and best practice guidance. The Performance Standards included consideration of the different project types, namely:

- New construction,
- Refurbishments, and.
- Listed buildings

As well different building types including:

- Residential,
- Commercial, and
- Public buildings

This aligns with the categories and descriptions in the overall Net Zero Design Standard.

#### **Technical Standards:**

The Technical Standards provide guidance on the application of the technology or component within the project. As with the Performance Standards, the application of these Technical Standards is considered through the lens of different project and asset types. Information is also provided where the Technical Standards overlap with relevant existing CoLC standards and guidance. The guidance for the Technical Standards is divided into the following sections:

- Key design and operation considerations
- Compatibility/ Future Proofing, and Environmental Impact.

One of the ten 'Technology Categories' is Fabric. For this category the guidance is divided into:

- Installation Requirements,
- Structural Requirements
- Compatibility/ Future Proofing, and
- Material/Environmental Requirements

Guidance in the Future Proofing section is aligned with the outputs of the CoLC current Climate Impact Modelling works. This work is assessing the potential impact and mitigation measures of climate change on building assets with respect to temperature and pluvial / fluvial flooding risk. Page

398

### **TECHNOLOGY CATEGORIES**

### The section below introduces the ten technology categories and individual technology subcategories covered by these categories. This section is also providing guidance on the interdependencies between the technology categories. For example, when considering roof upgrades, consideration of roof mounted renewable technologies should also be assessed.

Further information on the categories and subcategories will be found within the Performance Standards and Technology Standards guidance with references within the Appendix.

### **BUILDING FABRIC**

#### **Overview**

The term 'building fabric' refers to structural material and components of a building and is generally considered the layer of materials separating the interior of the building from the exterior.

The design of building fabric has a major impact on the operation of a building, including how much heat is transferred from the interior of the building to the exterior or gained from the exterior. A measure of this heat transfer can be determined by the material's U-value. The higher the U-value, the more potential for heat transfer to occur.

Heat can also be lost through a measure called air permeability, which quantifies how 'leaky' a building is. A building with higher air permeability is allowing the uncontrolled movement of air though holes or poor detailing within the building fabric. Uncontrolled movement of air can increase heating or cooling demand. Building fabric also can impact the building in the following ways:

- Daylight Provision whilst minimising energy demand without any undesirable side effects,
- Internal solar gains through design, size, and orientation of the windows,
- Noise and air quality,
- Improved thermal mass for heat storage
- Building aesthetics.

Consideration of these aspects when designing or refurbishing building fabric can contribute to a more energy efficient building in operation.

#### Interdependencies

In the context of building services and fabric, there is an inter-dependency between heating demand and other systems. For example, if improvements are made to a lighting system within a building, such as the replacement of in-efficient T-12 or T8 fluorescent lamps with efficient LED's, it may result in an increase in the building's heating load. Lighting systems generate heat when they are in use, and if they are upgraded to more energy-efficient options, they may produce less waste heat

#### **Internal Cavity Wall Insulation**

Cavity wall insulation involves the installation of insulating materials to the cavity (gap) between the inner and outer side of a cavity wall. Many cavity walls are insulated by injecting material into the cavity and requires specialist installers to adequately drill holes into the wall, fill the cavity, and properly reseal the hole, most likely with cement.

If the building being insulated has cavity walls, it is proposed that cavity wall insulation should be considered prior to solid wall insulation.

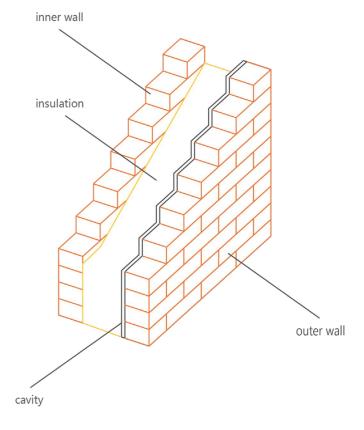


Figure 10 Cavity Wall

#### **External Solid Wall Insulation**

External solid wall insulation involves fixing a layer of insulating material to the external (cold) side of a wall. This insulating material is then covered with special types of render or cladding. The finish can be altered to match the desired aesthetic of the building. External wall insulation has the benefit of not interrupting the usage of the building and should not affect the activities of the building's occupants. Additionally, external wall insulation will not reduce the floor area of the building as all works are completed on the external face of the building. In addition to reducing heat loss, a solid wall insulation installation also makes a building more airtight, therefore additional natural or mechanical ventilation may be required to maintain air quality.

#### **Internal Solid Wall Insulation**

Internal solid wall insulation involves attaching a layer of insulating material to the internal (warm) side of a wall. A solid wall differs from a cavity wall as it is constructed of a single series of brick or stone. Internal wall insulation is a suitable option for insulating a solid wall, if the property has planning restrictions or other aesthetic value, as this will not alter the outer facade of the building. In addition to reducing heat loss, a solid wall insulation installation also makes a building more airtight, therefore additional natural or mechanical ventilation may be required to maintain air quality.

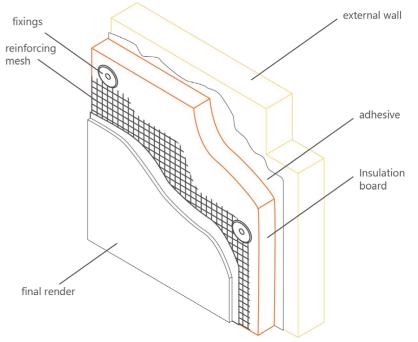


Figure 11 External Solid Wall Insulation

There are two main roof configurations:

#### **Pitched Roofs:**

- Warm roof: This is where insulation is installed immediately under the roof, within the plane of the roof pitch, meaning that the loft space beneath is also kept warm.
- Cold roof: This is where insulation is installed immediately above the ceiling of the top storey, meaning the loft space is not heated. This generally involves insulating between and over joists immediately above the ceiling of the top floor. Cold roof solutions are generally less expensive to install because there is a lot of available space, and so more economic, deeper insulation materials can be used.

### Flat Roofs:

• Warm deck (or warm roof): The 'deck' of the roof is below the insulation.

- Cold deck (or cold roof): The insulation is installed below the roof deck. For ventilation purposes, and to avoid condensation forming, ventilation usually provided around the perimeter of the roof.
- Inverted roof: The insulation is installed above the uppermost weatherproof membrane, of the roof structure, effectively protecting it from heat and cold which can cause damage in the long term.

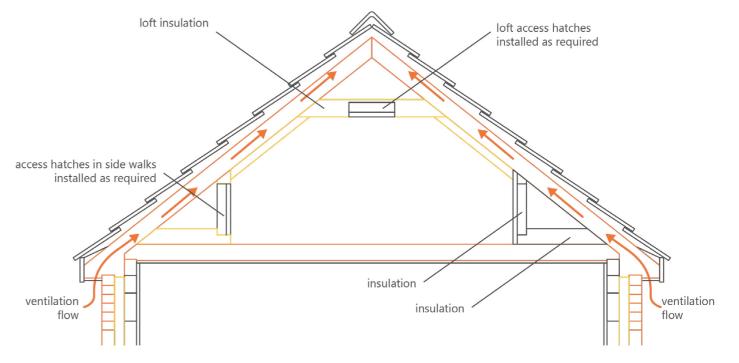


Figure 12 Room in Roof Insulation

### Window – Including Shading (and doors)

Making windows and glazed doors more energy efficient will reduce the heat loss, reducing heating costs and lower the building's carbon footprint. Energy efficient glazing seeks to minimise heat loss through windows avoiding draughts and cold spots. Well-designed glazed systems can help reduce condensation build-up within the building.

#### **Floor Insulation**

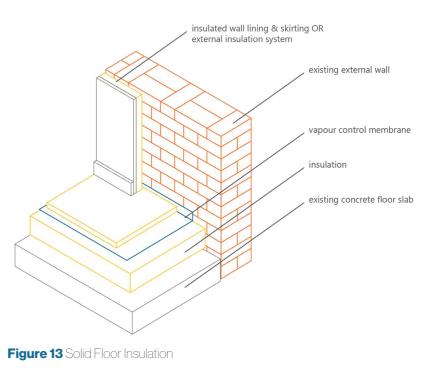
Newer buildings tend to have solid floors, built upon a concrete foundation. This makes insulating solid floor challenging as this is generally served by installing a rigid insulation foam. This can cause issues with adjusting the height of doors, radiators and plug sockets etc. Most modern buildings are already fitted with insulation, so this expensive disruption is generally mitigated in most solid floor buildings.

#### **Draught-proofing and Air Tightness**

Air tightness typically refers to how 'leaky' a building is. Air tightness testing involves determining the amount of air leakage (m3 of air/m2 of internal surface area of the building). Buildings with high air permeability will have higher heating requirements due to cold air leaking through the building fabric of the building.

Air typically leaks through:

- Unsealed or poorly sealed doors and windows,
- Unsealed vents, skylights, and exhaust fans, gaps in or around ceiling insulation and around ceiling penetrations (for example, downlights, pipes, and cables),
- Gaps around wall penetrations (for example, pipes, conduits, power outlets, switches, airconditioners, and heaters),
- Gaps between building envelope junctions (for example, floor-wall or wall-ceiling),
- Poorly fitted or shrunken floorboards.



ω							l ools)
				New build	Refurb Listed	Residentia	Commercia Public (e.g. Sch
	Requirements	Performance Requirements	Measurement Standards / Test Conditions	Asse	t Type	Build	ing Type
	Category / Sub-category	Performance standards and specifications from industry standards, regulations and guidance to set the CoLC Standard					
GO BACK	Building fabric Wall Insulation Performance Threshold	Note: These U-values provided are maximums and should not be exceeded. The notional value is based on a theoretical design required to be compliant within Part L regulations. The Limiting Values are not to be exceeded under current regulations. Building Regulations: Approved Document L1 2021 Requirements (Residential) • Limiting U-Value (new residential) = 0.26 W/m2K • Limiting U-Value (existing residential / new element) = 0.18 W/m2K	Building Regulations Conservation of fuel and power: Approved Document Part L1 [GN.1] Building Regulations Conservation of fuel and power: Approved Document Part L2 [GN.2]	ļ			
		elineting devalue (existing residential / new element) = 0.16 w/m2x elineting = 0.16 w/m2x		V	√ √	V	
	External solid wall insulation Performance Requirements	Performance Requirements (LETI Design Guide): •Residential = 0.13-0.15 W/m2K •Non-Residential = 0.12-0.15 W/m2K	The U-value must be calculated in accordance with the conventions in the current version of BR443 conventions for calculating U-values [WI.1] LETI Design Guide [W.11]	~	• •	~	✓ ✓
	Internal solid wall insulation Performance Requirements	Performance Requirements (LETI Design Guide): •Residential = 0.13-0.15 W/m2K •Non-Residential = 0.12-0.15 W/m2K	The U-value must be calculated in accordance with the conventions in the current version of BR443 conventions for calculating U-values [WI.1] LETI Design Guide [W.11]	~	å	~	✓ ✓
	Internal cavity wall insulation Performance Requirements	Performance Requirements (LETI Design Guide): •Residential = 0.13-0.15 W/m2K •Non-Residential = 0.12-0.15 W/m2K	The U-value must be calculated in accordance with the conventions in the current version of BR443 conventions for calculating U-values [WI.1] LETI Design Guide [W.11]	$\checkmark$	• •	$\checkmark$	✓ ✓
Со васк	Roof Insulation Performance Threshold	<ul> <li>Note: These U-values provided are maximums and should not be exceeded. The notional value is based on a theoretical design required to be compliant within Part L regulations. The Limiting Values are not to be exceeded under current regulations.</li> <li>Building Regulations: Approved Document L1 2021 Requirements (Residential): <ul> <li>Limiting U-Value (new residential) = 0.16 W/m2K</li> <li>Limiting U-Value (existing residential / new element) = 0.15 W/m2K</li> <li>Limiting u-Value (existing residential / new element) = 0.15 W/m2K</li> <li>If existing element is higher than 0.35 W/m2K then must be improved to at least 0.16 W/m2K.</li> </ul> </li> <li>Building Regulations: Approved Document L2 2021 Requirements (Non-Residential): <ul> <li>Limiting U-Value (new &amp; existing buildings) = 0.18 W/m2K (filat) and 0.16 W/m2K (pitched)</li> <li>If existing element is higher than 0.35 W/m2K then must be improved to at least 0.16 W/m2K (pitched) or 0.18 W/m2K for flat roofs.</li> </ul> </li> </ul>	Building Regulations Conservation of fuel and power: Approved Document Part L1 [GN.1] Building Regulations Conservation of fuel and power: Approved Document Part L2 [GN.2]	V	•••	~	✓ ✓
	Roof insulation Performance Requirements	Performance Requirements (LETI Design Guide): •Residential = 0.10-0.12 W/m2K •Non-Residential = 0.10-0.12 W/m2K	The U-value must be calculated in accordance with the conventions in the current version of BR443 conventions for calculating U-values [WI.1] LETI Design Guide [W.11] Design Guide [W.11]	~	• •	~	✓ ✓
	<b>Window</b> Performance Threshold	Note: These U-values provided are maximums and should not be exceeded. The notional value is based on a theoretical design required to be compliant within Part L regulations. The Limiting Values are not to be exceeded under current regulations. <b>Building Regulations: Approved Document L1 2021 Requirements (Residential):</b> • Limiting U-Value Window (new residential) = 1.6 W/m2K • Limiting U-Value Gazed door (new residential) = 1.6 W/m2K • Limiting U-Value Golight (new residential) = 2.2 W/m2K • Limiting U-Value for onoflights (new residential / new element) = 1.4 W/m2K • Limiting U-Value for rooflights (existing residential / new element) = 2.2 W/m2K • Notional U-Value = 1.2 W/m2K (Frame Factor = 0.7) <b>Building Regulations: Approved Document L2 2021 Requirements (Non-Residential):</b> • Limiting U-Value Door = 1.6 W/m2K • Limiting U-Value Door = 1.6 W/m2K • Limiting U-Value Door = 1.6 W/m2K • Limiting U-Value Rooflight = 2.2 W/m2K	Building Regulations Conservation of fuel and power: Approved Document Part L1 [GN.1] Building Regulations Conservation of fuel and power: Approved Document Part L2 [GN.2]	V	• •	~	√ √

7 7 4				New build	Refurb	Listed	Residential	Public (e.g. Schools)
	Requirements	Performance Requirements	Measurement Standards / Test Conditions	As	sset Type	e E	Buildir	g Type
	Category / Sub-category	Performance standards and specifications from industry standards, regulations and guidance to set the CoLC Standard						
GO BACK	Window – including shading (and doors) Performance Requirements	Performance Requirements (LETI Design Guide): All new buildings = 1.0 W/m2K (triple glazed) with a g-value between 0.5-0.6 Window edges are susceptible to thermal bridging, ensuring installation is in line with the Zero Carbon Hub Thermal Bridging Guide, these elements can be limited tov=0.03	The U-value must be calculated in accordance with the conventions in the current version of BR443 conventions for calculating U-values [WI.1] LETI Design Guide [W.11]	√	•	•	√ ,	· ~
	Floor Insulation Performance Threshold	Note: These U-values provided are maximums and should not be exceeded. The notional value is based on a theoretical design required to be compliant within Part L regulations. The Limiting Values are not to be exceeded under current regulations.         Building Regulations: Approved Document L1 2021 Requirements (Residential):         • Limiting U-Value (new residential) = 0.18 W/m2K         • Limiting U-Value (revisiting residential / new element) = 0.18 W/m2K         • If existing element is higher than 0.7 W/m2K then must be improved to at least 0.25 W/m2K.         Building Regulations: Approved Document L2 2021 Requirements (Non-Residential):         • Limiting U-Value (new & existing buildings) = 0.18 W/m2K         • If existing element is higher than 0.7 W/m2K then must be improved to at least 0.25 W/m2K.	Building Regulations Conservation of fuel and power: Approved Document Part L1 [GN.1] Building Regulations Conservation of fuel and power: Approved Document Part L2 [GN.2]	V	•	•	√ ,	· •
	Floor insulation Performance Requirements	Performance Requirements (LETI Design Guide): •Residential = 0.08-0.10 W/m2K •Non-Residential = 0.09-0.12 W/m2K	The U-value must be calculated in accordance with the conventions in the current version of BR443 conventions for calculating U-values. [WI.1] The U-value of the floor of an extension may be calculated using the exposed perimeter and floor area of either the whole enlarged building o the extension alone. If meeting such a standard would create significant problems in relation to adjoining floor levels, a lesser standard may be appropriate.	0 √	•	•	√ ,	. ~
	Draft Proofing and Air Tightness Performance Threshold	Note: These air permeability values provided are maximums and should not be exceeded. The notional value is based on a theoretical design required to be compliant within Part L regulations. The Limiting Values are not to be exceeded under current regulations.  Building Regulations: Approved Document L1 2021 Requirements (Residential):  Notional new residential = 5 m3/(h.m2) at 50 Pa Limiting value for new residential = 8 m3/(h.m2) at 50 Pa Building Regulations: Approved Document L2 2021 Requirements (Non-Residential): Limiting value for new and existing buildings = 8 m3/(h.m2) at 50 Pa	Building Regulations Conservation of fuel and power: Approved Document Part L1 [GN.1] Building Regulations Conservation of fuel and power: Approved Document Part L2 [GN.2]	V	•	•	√ ,	· •
GO BACK	Draught-proofing and air tightness Performance Requirements	Performance Requirements (LETI Design Guide): • All new developments: <1 m3/(h.m2) at 50 Pa	The Approved Documents now refer to CIBSE TM23 [DP.2] for measuring air tightness.	$\checkmark$	•	•	√ .	~

5	Requirements Category / Sub-category	Technical standards - For references, please refer to the 'Appendix' tab For their guidance on design considerations and how the technology category or sub-category should be installed to deliver the genformance standard targets				Point Gungae Asset Type	Residential Commedia Public (e.g. Schools)	City of London Document Interfinks (TBC) Task Bar PPC Activities	Project Management Mechanical Engineer	Electrical Engineer Architect Public Health Engineer	M Erre Engineer Contractor Building FM / End User
	Building fabric	Installation Requirements  Installation Requirements Installation Added be fitted without any air gaps and tight to the structure. Where fire-stopping socks are required, these should fully fill the areas where they are fitted [WIS]. Installation Added be fitted without any air gaps and tight to the structure. Where fire-stopping socks are required, these should fully fill the areas where they are fitted [WIS]. Installation Added be fitted without any air gaps and tight to the structure. Where fire-stopping socks are required, these should fully fill the areas where they are fitted [WIS]. Installation Added be fitted without any air gaps and tight to the structure. Where fire-stopping socks are required, these should fully fill the areas where they are fitted [WIS]. Installation Added be fitted without any air gaps and tight to the structure. Where fire-stopping socks are required, these should fully fill the areas where they are installation should be fitted without any air gaps and tight to the structure. Where fire-stopping socks are required, these should fully fill the areas where they are installation should be fitted without any air gaps and tight to the structure. Where fire-stopping socks are required, these should fully fill the areas where they are installation should be fitted without any air gaps and tight to the structure. Where fire-stopping socks are required, these should fully fill the areas where they are	Structural Requirements  • Consult Fire Specialita to determine that any proposed insulation meets the required fire regulations for each specific building use. • As a minimum requirement, movement joints in render must be provided to match the locations of movement joints in the structura. They should also be located at changes of subarrate. The principal guidance standards relating to joint dreign and sealant selection are 85 GOV3 [WiG] and 85 C11 and 95 C11 (WiG) requesteries. • If the insulation is considered on combactble, e.g. mineral wool, fire barriers may not be required. Fire barriers or stops may, however, need to be considered in subarrate relating to the structure of the barriers may not be required. Fire barriers may not be required from the specific building Regulation solutioned for the barriers may not be required. Fire barriers may not be required for the barriers may not be required. Fire barriers may not be required. Fire barriers may not be required for the barriers may not be required. Fire barriers may not be required for the barriers may not be required for the barriers may not be required for the barriers may not be required. Fire barriers may not be required for the barriers may not be required for the barriers may not be required. Fire barriers may not be required for the walls and the degree of loading required to be countered. Must adhesive fixed systems recommend additional mechanical fixings. • Consult fire Specialito to determine that any ornobard insulation mets the required fire regulations for each specific building use.	through openable windows and extract finas or with the use of a vertiliation systems such as MMRR, contral a suitably qualified MIP engineer to determine vertiliation experiments. [W13]. • Fabric Losses should be calculated according to the latest BS IN 2831 Standard. External design temperatures should ertificate and imperatures experiments in the winter having season and a suitable should be excised for 56.5% of the year (W113). Consideration: Complete an overheating analysis if retrofiting improved fabric and ar hightness. This should be inline with Part Of the Building Regulations (W112). CBSI TMRR effers specific overheating guidance for properties in London (W113). Residential Consideration: Completing in A hould be mitigated following the principles laid out in AS2 XDS (W14). External shading, whether that be permanent or automated, is the most effective way to reduce solar gains in a room and should be considered first and foremant. (W1.32):	Material / Environmental Requirements  The U-value must be calculated in accordance with the conventions in the current version of BR432 conventions for calculating U-values. W13]. The Fire Safety DBI published in March 2020 places beyond doubt that external wall systems fall within the scope of the Regulatory Reform Fire Safety DBI published in March 2020 places beyond doubt that external wall systems fall within the scope of the Regulatory Reform Fire Safety DBI published in March 2020 places beyond doubt that external wall systems fall within the scope of the Regulatory Reform Networks Control (Control Control		•••	ICity of London     In) Section 6.10:     Comportation:     Comply with British Standards at the time of     Housing Design     Construction.     Guide Dee 2020     Comply with the requirements of the Local     Authority Building Control (LARC), including the LABC     warranty.     Comply with the project-wide requirements of     energy efficiency.     I) City of London     1a) Section 6.10:	~	~	/ ~ ~
GOBACK	Internal solid wall insulation	<ul> <li>Inter (IV V):</li> <li>Higgsthemit modeling should be used to assess moisture risk as advised in BS320. The simple Glaser method is only subable for moisture closed and weatheright constructions, whereas dynamic hygosthemia simulation (using othware such as WUF or biphin) should be used for moisture closed and the subable for area of the room where it is installed.</li> </ul>	<ul> <li>As a minimum requirement, movement joints in render must be provided to match the locations of nonvenent joints in the structure. They should be located at charges of waters. The invite and is Statistical Part of /li></ul>	openative windows and extract fanse. Consult MEP engineer to determine if new werklation systems such as MUNR in required [VII.3]. • Patible head versions (VII.5) • Patible head versions (VI	[WL3]. The Fire Sale Sale and the scope of the scope of the scope of the scope of the first scope of the first scope of the first scope of the s		J J J	Corporation: -Comply with British Standards at the time of Housing Design: Contruction Guide Dec 2020 -Comply with the requirements of the Local Automotive Standard Control (LAG), including the LABC warranty	×	J.	r 3 3
	Internal cavity wall insulation	<ul> <li>Insidiation should be fitted without any all gaps and light to the structure, carvity closer, limits and carvity targe, Mortar sorts should be remeved to ensure a light fit with the structure, carvity closer, limits and carvity targe man effect.</li> <li>Insidiation should be fitted without any all gaps and lights to the structure, carvity closer, limits and carvity targe. Mortar sorts should be remeved to ensure a light of the structure, carvity closer, limits and carvity targe man effect, including at the weather light control is not y sublable for mosture closed and weather light controls, whereas quarking hypothemal impaction [units gather and and units [units gather and units [units [units gather and units [units gather and units [units gather and units [units [u</li></ul>	<ul> <li>As a minimum requirement, movement joints in render must be provided to match the locations of novement joints in the structure. They should also be located at changes of substrate. The principal guidance standards relating to joint design and stalant selection are BS 69313 [WI-6] and BS 61313 [WI-1] respectively.</li> <li>If the instalation is considered non-combustble, e.g. mineral wood, fire barriers may not be required. Fire barriers or stops may, however, need to be considered in vulneral lenge, e.g. at window opering, doorway, and around presentations in the system. Charles</li> </ul>	openable windows and extract fams. Consult MP engineers to determine if new vertilation systems such as MVHR is required [W13]. P exolative Input Ventilation [PN] should note be installed with internal wall installation. This is due increased risk of installation and the line of the internal wall installation. This is due increased risk of installation and the line of the installed results and the line of the installed results and the line of the installed results. The is due to use the wall and the line (W14) is the latest BS IN 12831 Standard. External design temperatures should reflect typical low in the latest BS IN 12831 Standard. External design temperatures should reflect typical low in the latest BS IN 12831 Standard.	* The Uvalue must be calculated in accordance with the conventions in the current version of BRA43 conventions for calculating Uvalue, WL1]. (W11) (W12)			<ol> <li>City of London 1a) Section 5 a:: Comportation: Comply with Initiah Standards at the time of Housing Design Construction. Guide Dez 2020. Automity Faulting Control (LABC), including the LABC warranty. - Comply with the project-wide requirements of energy efficiency.</li> </ol>	~	~	, , ,
	Roof insulation	<ul> <li>Instations should be installed tight to the structure, without air gaps, and should extend to the wall instation. For roots installed at colling level, the integreem protection of the insulation layer should be considered barded are should be provided above thin instalson is give excess of maintainmance [R1:1]</li> <li>Root that have multiple rooms will inherently have thermal bridges due to lotternal walks. However, these can be mitigated, usually by returning a layer of installation along the wall for that is using the minimal bridges. The should be traded to assess motivate provided in the should be provided for motiture closed and weather tight construction, where ad prevent layers and a splitcharms in close 1. Structure is a structure, have a should be provided to used and weather tight construction, where ad prevent layers and a splitcharm's to have 3. Woll or bridget have a block of motitare closed and weather tight construction, where ad a prevent instructure (see and a splitcharm) increases and built or bridget have a block of motitare closed and weather tight construction, where ad a prevent layers and a splitcharm's increases?</li> <li>Ari leading into rol odics can vary high anomatic to construct and ageid and have a split or disclosed to condensation on tentes and the underside of roding end of the ordistruct and installated of roding the split of the ordistruct and installated at celling level, this could be through mechanical means, but natural ventilation is recommended to reduce energy consumption.</li> <li>Retroft Consideration: No retrofts should be underside ventilation system should be in operation upon completion of the works.</li> </ul>		to replace or dente the table. • A schedule of pentations, their dimensions, orientation, and the applicable scaling method should be provided as part of the design [R12]. • As insulation is added, the airtightness increases, meaning less ventilation is moving through the building. This can be mitigated through openable windows and extract fans. Cansult MIP engineer to determine if new ventilation systems such as MVIR is required [R14].	[RL6]. • The Fire Safety Bill published in March 2020 places beyond doubt that roof systems fall within the scope of the Regulatory Reform (Fire Safety) Order 2005 [RL7]. Consult fire specialist to determine if proposed insulation meets the required fire regulations.	√ • •	5 5 E	<ol> <li>Dip of London 1a) Section 5 a: Corporation: Comply with finish Standards at the time of Housing Design Comby Comby with the requirements of the Local Authority Building Control (LARG), including the LABC warranty. - Comply with the project-wide requirements of energy efficiency.</li> </ol>	×	×	
GO BACK	Window – including shading (and doors)	<ul> <li>Vindows and doors should be installed to that the hermal integrity of the installed place is maintained [VL]:</li> <li>Literance around and/ow of odo bytable is incordinate to 18 Stall-14 (VL)</li> <li>Literance around and/ow of odo bytable bit is incordinate to 18 Stall-14 (VL)</li> <li>Literance around and/or door should be located, and/or Stall-14 (VL)</li> <li>Literance around and/or door should be located and/or should be used, installed tytable unit and the inner face of the external leaf – for windows an overlap between 30mm and 30mm, and 67mm, and 67mmm, and 67mm, and 67mm, and 67mm, and 67mm, and 67mm, and 67mm</li></ul>	This standard relates to vertical indicases and doors. Designers should assess methods of minimising themal bridges [VL1]: Liuteits: consider using independent lintels with an installed cavity closure between the inner and outer lintel. For common leaf lintels, the base plate should not be continuous, and the linted cave bound be installed. III: installed cavity closens should be issued for all construction types. A loadinosity, installed plateheast should be seed in reveals to abut, ambs and should be considered within reveal soffsts. I For doors personal on 10 rains associated with length of the cave in their for K- for instructs are 10.50 fir door will offer 30 minutes of	unacceptedby after the character and appearance of the window (W.G.) = BELLAM crotels are available where the observation of the window (W.G.) = BELLAM crotels are available where the observation of the self-and constant of the part 22/12 (W.T.), CRSE = FarLO of the building Regulations provide guidance on maximum areas of glazing as a percentage of floor area, the values are provided body, with high relacions in brackets: Buildings with cross ventilation: Buildings with cross ventilation: Buildings with cross ventilation: E. South = 15% (USB) E. South = 15% (USB)	require that: Lis are conditioned and mixed mode buildings, building ar intakes and exhausts are over 10 m spart to minimize recirculation. Ar intakes must be over 20 m from sources of external pollution. If the over 20 m from sources of external pollution. If the over 20 m from sources of external pollution. If the over 20 m from sources of external pollution. If the over 20 m from sources of external pollution. If the over 20 m from sources of external pollution. If the over 20 m from sources of external pollution. If the over 20 m from sources of external pollution. If the over 20 m from sources of external pollution. If the over 20 m from sources of external pollution. If the over 20 m from sources of external pollution. If the over 20 m from sources of external pollution. If the over 20 m from sources of external pollution. If the over 20 m from sources of external pollution. If the over 20 m from sources of external pollution. If the over 20 m from sources of external pollution. If the over 20 m from sources of external pollution. If the over 20 m from sources of external pollution. If the over 20 m from sources of external pollution. If the over 20 m from sources of external pollution. If the over 20 m from sources of external pollution. If the over 20 m from sources of external pollution. If the over 20 m from sources of external pollution. If the over 20 m from sources of external pollution. If the over 20 m from sources of external pollution. If the over 20 m from sources of external pollution. If the over 20 m from sources of external pollution. If the over 20 m from sources of external pollution. If the over 20 m from sources of external pollution. If the over 20 m from sources of external pollution. If the over 20 m from sources of external pollution. If the over 20 m from sources of external pollution. If the over 20 m from sources of external pollution. If the over 20 m from sources of external pollution. If the over 20 m from sources of external pollution. If	J J •	v v v	1) Citry of London P120: Glating must be designed and specified corporation: Corporation: Housing Design use as part of a holistic design balancing heat gain, Guide Dec 2020 heat loss, and daylight.	~	~	
	Floor insulation		1042 [F4.]. • Generally, the following provides an indication of the floor configurations that may be more at risk from cold bridging [F13]: (3) incl. joint (2) more will not exceed 0.2 and is therefore highly utilitiely to be an issue. It is incl. joint (2) more all is also utilitiely to create a low givent threat in actrime shatabox where original hardwood joints and floorboards remain). It is incl. joint (2) more all is also utilitiely to create 0.2 W/m2x, and therefore building legulations will not be satisfied. It is included to be a solution of the context of 20 W/m2x, and therefore building legulations will not be satisfied. It is included to be a solution of the context of the satisfied of the satisfied.	any required penetrations are considered.	which determine the levels of heat transfer, where the lower the value, the less heat that is transferred through [FL3]: 1. Stores Wool = 0.038 W/mK 4. Sheeps Wool = 0.038 W/mK 5. Sheeps Wool = 0.038 W/mK 5. Sheeps Wool = 0.038 W/mK 5. Sheeps Wool = 0.032 W/mK 5. Sheeps Wool = 0.038 W/mK 5. Sheeps	<b>v</b> v v	v v v	3) City of London 1a) Section 5 a: Coroparation: Comply with first his Mandards at the time of Housing Design Guide Design Construction. Comply with the requirements of the Local Authority Building Control (LMBC), including the LMBC warranty. Comply with the project-wide requirements of energy efficiency.	~	~	
	Draught-proofing and air tightness	Achitest and degrees need to take responsibility of artiphness early in the design tage, setting an overall strategy for implementation and buildeality.     A test should be included in the terresponding to artiphness early in the design tage, setting the tartightees to be found before work is covered up and ensure     accountability of installation [D*1]:     In that test is to be completed as soon as the building has been made air tight.     In the tart is to be completed as soon as the building has been made air tight.     In that on completion of monaction     The Aprived Bio Completed as compared as completed as and the set of the	junctions, risks to airtightness should be identified along with how building envices interact with the airtightness layer (IDP.4) - Airtightness tages on the used to sail interfices between two air starses (IDP.3) I. Tapes are available for almost any surface and junction, although some tapes require an additional adhesive or primer to be applied prior to application. II. Tapes are best used for linear joints. II. Tapes specifications tudies for ferenced in all drawings.	<ul> <li>MVH8 spatems should only be natisatiled in properties with an air permeability of a m/m1.hour @SVPa or less.</li> <li>Improvements to be interpretenting real rightness measures have reduced infiltation and therefore, version and should be considered first and forematic parts or reduce solar gains in a norm and should be considered first and foremat (pP 10).</li> </ul>	<ul> <li>To construct an arright construction, there must be an identified air karter that is pinned up to form a complete logs. This does not request to be constructed of the same metal [DP.8].</li> <li>A Arright constructions can be constructed of different materials within the same design. These materials should be made identifiable on drawings.</li> <li>B actions fining a gland construction, the constructor must apply airlightness tape to the sides and top of the window. The tape must be continuous on all 3 sides [DP.3]</li> </ul>	J J J	✓ ✓ ✓	3) (Chy of London P120: The minimum air-tightness requirement is 3 Corporation: ma/(h.m2)@50Pa. Housing Design Guide Dec 2020	~	~	

Page 405

# HEATING

#### **Overview**

Decarbonising energy used to heat in buildings is a key part of the UK Government's Green Growth Strategy and critical in achieving the Government's net zero agenda. In 2021 the Government published its Heat in Buildings Strategy which outlines their ambition to phase out the installation of natural gas boilers beyond 2035 and for new construction this is likely to be implemented in Future Homes and Buildings Standard by 2025.

Decarbonisation of building heat is critical component of CoLC strategy for Net Zero buildings. This section summarises information on currently commercially available building heating technologies, with emerging technologies reviewed in the next section.

Heating systems provide heat from a generation plant or move heat from external sources to serve conditioned spaces or targeted areas. When sized correctly the systems will ensure suitable internal temperature in the spaces are maintained. Heat generation is usually centralised with heat is distributed throughout a building using water or air as the transfer medium. Heating emitters such as radiators or fan coil units' interface with the distributed water or air to condition the space. Heating controls ensure effective generation and delivery of heat to match occupancy and environmental requirements. These controls can be on the generation, distribution network or heat emitters and can be used to control the entire building or specific zones. Heating can be provided locally by radiant heating to transfer heat / raise temperature in a small, targeted area.

As we move away from fossil fuels, and with an uncertain future for hydrogen heating, the current options for heating technology are:

- Connection to a low carbon heat network,
- Electrification of heat through heat pumps, or
- Direct electric heating, or
- Use of biofuel.

Decisions about which technology or fuel will be most appropriate for a particular project will need to be taken at the outset ensuring that the technology can work effectively in the new construction or refurbishment project. For example, heat pumps work most effectively at lower than traditional heat distribution temperatures and may require additional electrical supply capacity.

The implications of these building modifications on such as cost, and delivery programme will need to be considered when selecting the most appropriate technology. For all projects, the viability of connecting to Citigen district heating network should be considered first followed by the most efficient electric heating options with cost and GHG emissions compared. From this point alternative heating options should be considered at the beginning of the design process using heat decision trees set out in LETI Climate Emergency Design guidance and CIBSE TM53 Refurbishment for non-domestic buildings or similar.

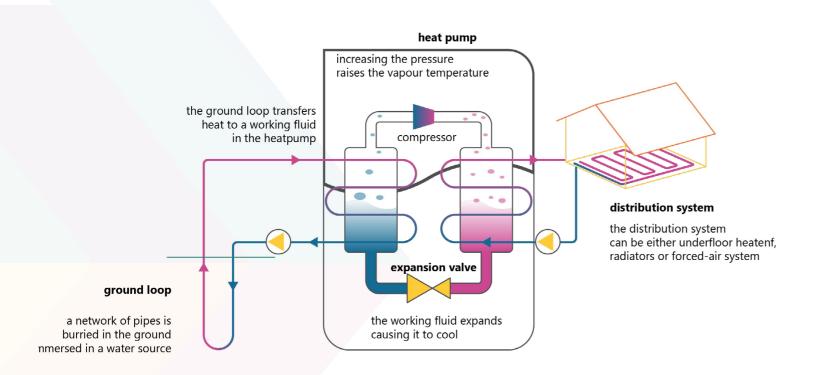


Figure 14 Example Schematic of Ground Source Heat Pumps and the vapour compression cycle

No matter which heating technology is chosen it is important a whole building approach is considered where appropriate to ensure heat demand is reduced alongside the introduction of low carbon heating.

#### Interdependencies

The inter-dependencies for heating with other building services and fabric are that if lighting systems have been improved, there may be an increased heating load for the building. Additionally improving the building fabric will reduce the required heating load for the building which will support the feasibility of installing a low-temperature heating system such as air source heat pumps (ASHP). All heat pumps use electricity to drive an evaporation / condenser cycle to move heat from one side of the system to another. Heat pumps use the 'vapour compression cycle', the same thermodynamic cycle as refrigerators. The simplest form of this cycle uses four basic components: a compressor, an evaporator, an expansion valve and a condenser.

A heat pump concentrates 'low grade heat' (which in the UK is from around -10°C to 2°C) from the environment into higher grade heat that can be used for space heating and domestic hot water. Heat pumps are most efficient when delivering low temperature hot water (LTHW) to suitable systems such as underfloor heating at 30-45°C, fan coils at 35-55°C, and radiators operating at 45-55°C. High temperature heat pumps are also available which can provide higher distribution temperatures but can be lower in efficiency.

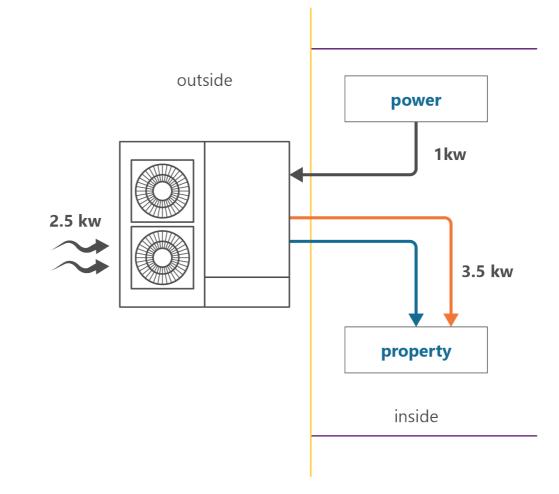


Figure 15 Example Schematic of Air Source Heat Pump

Heat pumps use electricity and therefore the associated GHG emissions are determined by the carbon intensity of the electricity used. Depending on the efficiency of the heat pump and the temperature of the heat supplied the efficiency improvement on electric resistance heating can be from 200%-600% (or more). There are different types of heat pump depending on the source use to extract heat from the environment, this can be from the air, the ground, water, sewers or other waste heat sources. Heat pumps are often referred to by the source of energy that they use.

The level of performance for a heat pump is measured by its Coefficient of Performance (COP). The COP is defined as the ratio of the useful heating provided to the electrical energy input. Note that this is the COP specifically for a heat pump, for a refrigerator the COP is the ratio of the cooling provided to the electrical input. Another useful measure of the performance of a heat pump can be found by calculating the Seasonal COP (SCOP). This is defined as the ratio of the total useful heating provided over a year to the total electrical consumption.

The driver to use other sources of heat aside from air, such as river, sea, sewer or ground is that the seasonal temperatures are potentially higher (especially in winter when the heat is needed). This improves the SCOP. A higher SCOP means that the heat pump will require less energy (electricity) and therefore have lower running costs and potentially lower GHG emissions.

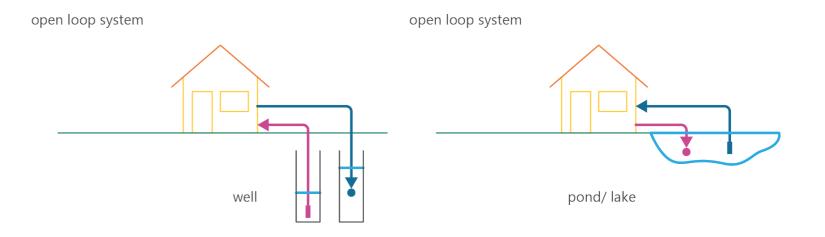
# Air Source Heat Pumps: Air to Water Heat Pumps

Air source heat pump (ASHP) systems use an external unit to extract heat from the air to efficiently provide heating. Air-to-air air source heat pumps eject cooled or warmed air through an indoor unit to condition the room based on design set points and conditions. They are commonly referred to as 'air conditioning units'. The various types of heat pumps are:

- **Split System** with one 'outdoor' unit and one 'indoor' unit.
- **Multi-split System** with an 'outdoor' unit connected to one or more 'indoor' units using a common refrigerant circuit with the indoor units individually controlled.
- Variable Refrigerant Flow (VRF) System automatically adjust the flow of refrigerant to each 'indoor' unit so that the heat delivered is matched to the demand.

 Packaged system - single factory assembled units that incorporate all the elements of the refrigeration system and air distribution mechanisms for space heating, often referred to as 'roof-top' due to the most common placement of the product.

Air-to-water heat pumps provide heating and cooling to chilled water (CHW) or low temperature hot water (LTHW) distribution systems. These include fan coil units (heating / cooling), radiators (which may need to be resized if refurbishing a building as heat pumps work on lower distribution temperatures than traditional heating systems) and underfloor heating. These can also provide cooling to emitters of chilled beams, fan coil units (which provide heating as well) and soffits.





### (Ground / Water Source) Water to Air Heat Pumps: Split (non-VRF), Multi-split (VRF)

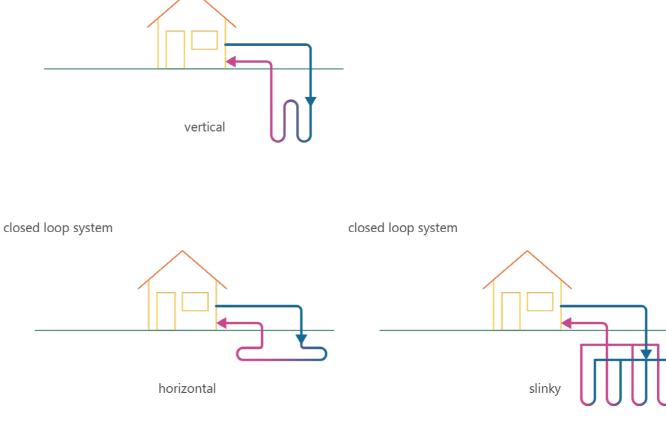
Ground Source Heating pumps (GSHP) utilise fluids to absorb heat from the ground.

A water source heat pump takes energy from canals, the sea and rivers. Water is pumped into the system where the latent heat is used to compress a refrigerant.

Ground systems use one of two heat collection methods. There are two types of system:

- an open loop system extracting water from underground and
- a closed loop system.

An open loop system requires access to an adequate water supply or aquifer. A high-level hydrogeological assessment will likely be required to identify the feasibility of an open loop system. A water source heat pump is essentially an open look system but extracting water and heat from surface water as opposed to ground water.





closed loop system

In a closed loop system, an electrically powered heat pump circulates water and antifreeze solution around a loop of pipe, absorbing heat from the ground into the fluid and then passing through a heat exchanger into the heat pump.

There are two distinct types of closed loop system. A horizontal system, where pipes are spread out in trenches in a field buried around 1-3 m below the surface and a vertical borehole system, where pipes route into the ground to a depth of 100-200 m. This also requires enough free land for the boreholes to be drilled and connected to a network, as digging vertically uses the space more efficiently. A typical 75-100 m borehole can provide 3-5 kW of extractable heat depending on the ground conditions. Like ASHP the performance is calculated via SPF. GSHP typically operate with SPF of 3.0 to 4.0 indicating that for each kilowatt of electricity used to drive the pump it will produce a further 3-4 kW of heat.

The relatively consistent ground temperature provides a benefit over air-source heat pumps. The main disadvantage of closed loop ground source heat pumps is that they require the installation of either vertical or horizontal loops to heat exchange with the ground. This adds cost and complexity to a project and additional maintenance concerns when operational.

### (Ground / Water Source) Water or Brine to Water Heat Pumps

These are similar to open loop ground or water source heat pumps. Ground or water-to-water heat pumps provides heating and cooling to chilled water (CHW) or low temperature hot water (LTHW) distribution systems. These commonly include chilled beams and soffits (cooling), fan coil units (heating/cooling), radiators and underfloor heating (heating).

#### **Condensing Gas Fired Boilers**

A boiler is a closed vessel in which water or other liquid is heated to generate steam or vapor. Energy used to heat the boiler can be from the combustion of fuels or using electricity. The heated liquid or steam generated from the boilers then passes on to a heat distribution system, heat emitters are often under control systems to optimise against environmental and occupancy requirements.

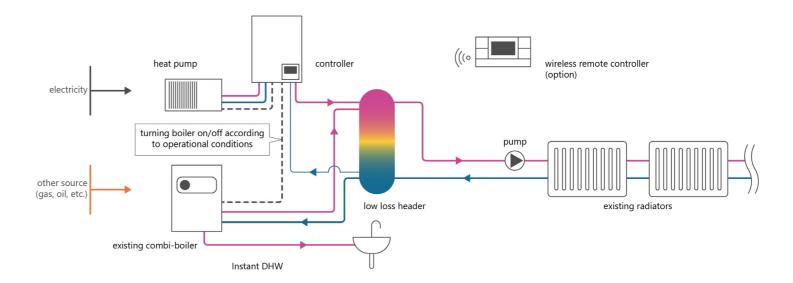
Gas is the most common fuel used for urban boilers due to the accessibility and ability to connect many houses to one supply. Gas boilers heat water which is then pumped round the home or building in the form of central heating or directly to taps. However, fossil fuels such as natural gas will be phased out by the Government in favour of lower carbon heating technologies and fuels. Only where no other options are viable should new gas boilers be specified for CoLC projects. Condensing gas-fired boilers typically use an additional heat exchanger to extract extra heat by condensing water vapour from the combustion products. This heat can be reused to pre-heat the water entering the boiler resulting in higher efficiencies than non-condensing gas-fired boilers.

#### **Electric Boilers**

Electric boilers are like traditional gas boilers, except that water is heated by passing an electric current through a heating element rather than burning gas.

#### **Bivalent Systems (Gas Boiler and ASHP)**

A hybrid heat pump refers to a system that uses a heat pump alongside another heat source, typically a fossil fuel or electric boiler. This could be an existing system, or the installation of a new boiler at the same time as the heat pump. These bivalent systems are potentially appropriate where an ASHP project may not be viable alone due to technical constraints to meeting the project delivery requirements. This could be constrained by available electrical power, poor building thermal performance, or inadequate system infrastructure. In the bivalent system, the ASHP is the primary system whilst the gas boiler provides the peak loads. The key benefit is that the majority of a heat can be provided by a low carbon heat source and provide some future proofing for the building. The drawbacks are that additional capital expenditure is required as well a maintenance costs can increase. Careful design is required to link the two systems.





#### **Electric Convectors**

Electricity Convectors are used to heat buildings through convection heating. Electric convectors are 100% energy efficient in the sense that all the incoming electric energy is converted to heat. However, this does not include the primary energy used for the electricity generation. These systems can have good temperature control such as individual thermostats or can be linked for zonal control via a BMS. GHG emissions are determined by consumption and the carbon intensity of grid electricity so can be relatively low in the medium term. However, as this technology uses direct electricity it is much less efficient than using the vapour compression cycle in a heat pump. Therefore, consumer costs and GHG emissions will be higher than if a lower carbon technology is used.

Electric Converters contain a heating coil and inlet / outlet grills, the system may also include a fan, dependent on design and manufacture. Cold air is drawn into the device where it meets a lightweight heating element, and is then passed out by a small, enclosed fan.

The hot air is then circulated, creating a convection current. It offers a rapid heating option for rooms which may be used less frequently. Electric convectors may be either free standing or permanent wall fixtures.

#### **Radiant heating**

Radiant heaters work by warming people and objects and not the air. They emit energy that is converted to heat once it hits and is absorbed by the body or object.

Radiant heating is particularly useful in buildings with high air change rates or large volumes that do not require uniform heating throughout, e.g., factories, and intermittently heated buildings with high ceilings. It was traditionally associated with gas-fired hightemperature, high-roofed industrial applications, however, low temperature radiant panel heating is now used in homes, offices, classrooms, and locations such as hospital patient waiting rooms.

### **High Temperature Radiant Heaters**

High temperature radiant heaters produce virtually 100% radiant heat output from their high surface temperatures. There are three main types:

- Direct gas-fired tubular heaters comprise a pressurised gas burner and a steel tube through which the flue gases flow radiating heat. Surface temperature may be around 500°C.
- Direct gas-fired radiant plaque heaters utilise a ceramic element which is directly heated by the gas flame, reaching temperatures of around 800°C.
- Electric quartz lamps comprise a lamp within a quartz tube, with the filament operating at temperatures exceeding 2,500°C

#### Low Temperature Radiant Heaters

Low temperature radiant panels are flat metallic surfaces that face into the room, heat output is mostly radiant. There are two main types:

- Low temperature hot water
- Electric infrared.

#### **District Heating Networks**

District Heating is a method by which the hot water demands (for space heating (HTG) or domestic hot water (DHW)) of a building is produced at a centralised, offsite location (an Energy Centre) and distributed to the building via a piped network, typically buried underground.

A District Heating Network will serve multiple, distributed buildings (potentially including residential and non-residential use-types) and users and provides the ability to produce and supply thermal energy in an overall more efficient, lower cost and / or lower GHG emissions manner, than if the heat was to be produced at the point-of-use itself (e.g., via domestic gas boilers, or otherwise).

District heating has several potential advantages, including the reduction of overall plant capacity (as large generation plant will be lower capacity than if installed across a number of individual buildings) which enables the introduction of renewable of low carbon fuels across a large area and attracts capital from third party investors and can enable future technology or fuel switching across multiple properties. CoLC currently has the Citigen heat network serving buildings with both heating and cooling. The viability of connecting to this heat network should be considered at an early optioneering stage of the project.

### **FUTURE HEATING**

#### Introduction

To achieve net zero emissions, we will have to transition away from traditional natural gas boilers for heating homes. Increasing the efficiency of current heating systems will not be enough to reach net zero by 2050. Considerations for future heating are that it needs to provide affordable, secure, and low carbon heat. Electric heat pumps, hydrogen, green gas and shared heat networks will be key technologies for development.

#### **Hydrogen Fuel Heating**

Hydrogen will be utilised in several ways in the coming years, Hydrogen produces no greenhouse gases at the point of use meaning it I will play a crucial role in reaching Net zero emissions. Hydrogen can be burnt to produce energy in the same way that natural gas can. This has led to the development of hydrogen ready boilers which can be used for LTHW heating systems. Hydrogen can also be utilised in a fuel cell to produce heat and power as a Low Carbon micro-CHP system. Fuel cells and hydrogen boilers require a green source of hydrogen to be fully carbon free.

The role of hydrogen in the built environment is still unclear, the Government has indicated an intention to publish a Hydrogen Strategy in 2026. However, it is likely that there will be role in the built environment with research and pilot studies are underway to assess feasibility of either pure hydrogen or blended hydrogen delivered through an upgraded gas network or delivered to the site in bulk. Hydrogen fuel is named on the basis of its method of generation:

- 'Grey hydrogen' when created from natural gas, or methane, using steam methane reformation but without capturing the greenhouse gases made in the process,
- 'Blue hydrogen' produced in the same way as grey hydrogen but using carbon capture and storage, and
- 'Green hydrogen' which is generated from renewable energy.

#### **Blended Natural Gas**

Blending natural gas and hydrogen is an intermediate step towards creating a 100% hydrogen network in the future. The ratio of the mixture is 80:20 natural gas to hydrogen. Mixing this amount of hydrogen into the natural gas network will require no changes to modern natural gas appliances and will therefore have very little impact on the end user.

### **DOMESTIC HOT WATER**

#### **Overview**

Page

419

A Domestic Hot Water System delivers hot water to fixtures / end points, which include sinks, showers, baths, and any appliance where hot water is required within a building.

The two main system types are:

- Centralised: where a central DHW plant serves all, or the majority, of DHW usage in a building. These systems can be combined with the central heating system serving the space heating.
- Decentralised: The hot water supply is separated from the central plant and smaller heaters are located closer to the point-ofuse, examples include under sink heaters and instantaneous showers.

These systems can be fuelled by a wide range of fuels, including but not limited to, mains gas, electricity, oil, and biofuels.

#### Interdependencies

The interdependencies with other building services with domestic hot water are that where there is a centralised systems serving heating and hot water these will be generated from the same heat source. A centralised system also makes it more suitable to use solar thermal hot water systems as hot water storage is required to optimise the system.

Solar Hot Water can be installed alongside conventional solar photovoltaic panels if there is sufficient roof space. Deciding on the most appropriate renewable technology needs to determine through an optioneering process and Best Available Technology Assessment.

### Centralised System: Gas-fired Condensing Water Heaters

Gas-fire condensing water heaters produce heat by burning fuel. Condensing boilers work with a 'Flue Gas Recovery System' which recycles the heat from the steam and stops it being lost. As the fuel burns, water vapour, which contains heat, is produced, and subsequently recovered. This increases the efficiency of the system compared to older non-condensing models.

### Centralised System: Air to Domestic Hot Water Heat Pumps

Air to Domestic Hot Water Heat Pumps transfer heat from the outdoor air to a domestic hot water tank, using a refrigeration cycle. These systems are electrically fuelled and can be used in both residential and commercial buildings. These systems can also be part of a combined heat pump system producing both space heating and hot water.

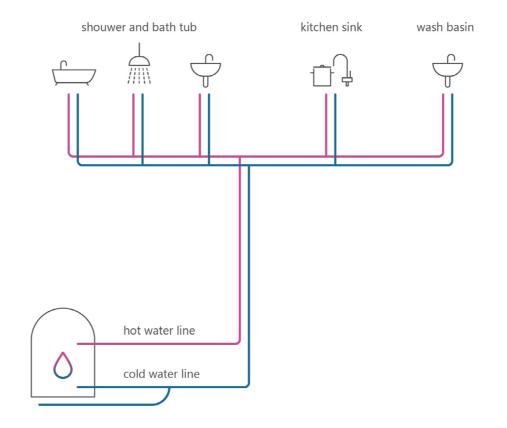


Figure 19 Example schematic of centralised domestic hot water supply

#### **Centralised System: Hot water boilers**

A hot water boiler works by using the fuel, such as oil, gas or electricity, to generate hot water. This is then circulated to a storage vessel or transferred directly to the point of usage.

#### **Point of Use Heaters**

Point of Use heaters heat the water close to the point of consumption for example, a sink, shower, or bath, where the water is used. These units may be installed anywhere with an adequate water and electrical supply, making them ideal for applications where a centralised system is not practical. These systems may also be used as a back-up or top-up for centralised systems.

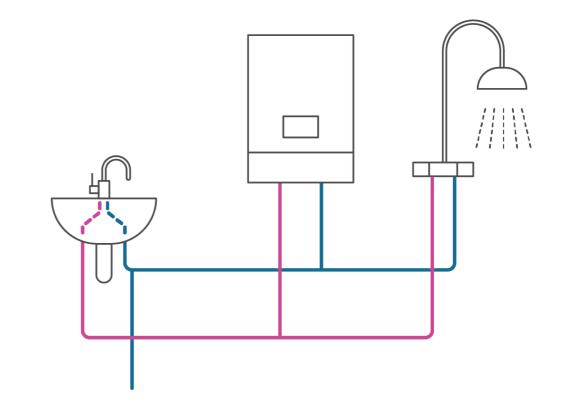


Figure 20 Example schematic of Use domestic hot water supply

#### **Solar Hot Water**

Solar hot water systems, also known as 'solar thermal', use solar panels to absorb heat and transfer it water which is circulated for use in the building.

Heat absorbed by the panels is used to pre-heat water that can be fed into a hot water storage cylinder or directly into a combination boiler.

An 'indirect' system works by heating liquid that is not the same as that drawn from the user points. In 'indirect' systems, normally a mixture of water and antifreeze is used and the heat from the sun is transferred to the water in the hot water cylinder by the way of a copper coil.

In a 'direct' system the water heated by the solar collectors goes directly into the DHW cylinder. This is less common in the UK due to issues with freezing and overheating.

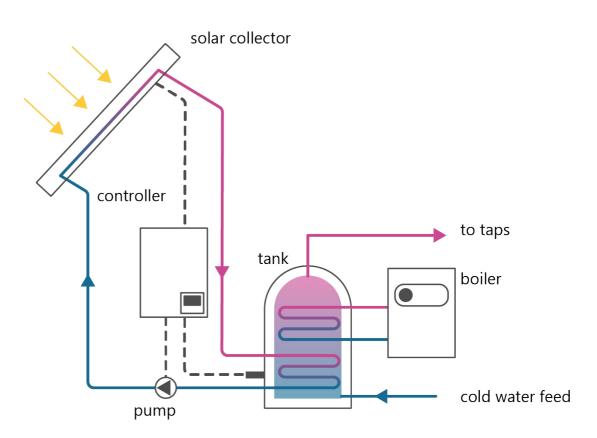


Figure 21 Example schematic of solar thermal system

S 2				New build Refurb Listed	Residential	Commercial Public (e.g. Schools)
	Requirements	Performance Requirements	Measurement Standards / Test Conditions	Asset Type	Bui	lding Type
	Category / Sub-category	Performance standards and specifications from industry standards, regulations and guidance to set the CoLC Standard				
	Heating					
	Heat pumps	Building Regulations: Part L1 Requirements:	Building Regulations Conservation of fuel and power: Approved Document Part L1 [GN.1]			
	Performance Threshold	<ul> <li>Electrically driven air-to-air heat pumps with an output of 12kW or less should follow Commission Regulation 2016/2281 for air heating products, cooling products, high temperature process chillers and fan coil units.</li> <li>For other types of heat pump, the Coefficient of Performance (COP) should be both COP ≥ 3.0 for space heating and COP ≥ 2.0 for water heating.</li> </ul>	Heating Mode: BS EN 14511-2, tables 3-19, standard rating conditions [C. 2] Cooling Mode: Commission Regulation (EU) No 206/2012 Annex II, average rating conditions [C. 31] Building Regulations Conservation of fuel and power: Approved Document Part L2 [GN.2]			
		• The minimum seasonal energy efficiency ratio of an air conditioner working in cooling mode should be SEER ≥ 4.0	Heating Mode: BS EN 14511-2, tables 3-19, standard rating conditions [C. 2] Cooling Mode: Commission Regulation (EU) No 206/2012 Annex II, average rating conditions [C. 31]			
		Building Regulations Part L2 Requirements:         All types of heat pumps in new and existing buildings must have a minimum Coefficient of Performance (COP) of:         •2.5 for space heating (except air-to-air with output ≤12kW)				
		<ul> <li>•2.0 for domestic hot water</li> <li>The minimum seasonal energy efficiency ratios (SEERs) for comfort cooling are:</li> <li>•Packaged air conditioners SEER ≥ 3.0</li> </ul>		√ √ •	$\checkmark$	$\checkmark$ $\checkmark$
		•Split and multi-split air conditioners SEER ≥ 5.0				
		<ul> <li>•Variable refrigerant flow/volume (VRF/VRV) systems SEER ≥ 5.0</li> <li>•Water-to-water chillers &lt;400kW SEER ≥ 5.0</li> </ul>				
		• Water-to-water chillers 400-1500kW SEER ≥ 6.0				
		•Water-to-water chillers >1500kW SEER ≥ 6.5				
GO BACK		Vapour compression cycle chillers, air-cooled <400kW SEER ≥ 4.0				
	Air to Air Heat Pumps: Split (non VRF), Multi-split	<ul> <li>•Vapour compression cycle chillers, air-cooled &gt;400kW SEER ≥ 4.5</li> <li>In Heating Mode, the Seasonal Space Heating Energy Efficiency (ns,h) should meet as a minimum:</li> </ul>	Heating Mode: Commission Regulation (EU) No 2281/2016 Annex III, tables 16, 21, 26, average rating conditions [HP.22]			
	(non VRF), and VRF heat pumps >12kW	<ul> <li>Single split (non-VRF) heat pumps ns,h≥165%</li> </ul>				
	(	•Multi-split (non-VRF) heat pumps ηs,h≥160%	Cooling Mode: Commission Regulation (EU) No 2281/2016 Annex III, tables 16, 27, average rating conditions [HP.22]			
	Performance Requirements	•VRF heat pumps ηs,h≥170%				,
		In Cooling Mode, the Seasonal Space Cooling Energy Efficiency (ns,c) should meet as a minimum:		√ • •		V
		•Single split (non-VRF) heat pumps ns,c≥250%				
		•Multi-split (non-VRF) heat pumps qs,c≥240%				
	Air to Air Heat Dummer Culit Multi culit and MDE	•VRF heat pumps ns.c2260%	Heating Made, Constitution Regulation (FU) No. 200/2012 Association 1, success acting and Julians (C. 21)			
	Air to Air Heat Pumps: Split, Multi-split, and VRF heat pumps ≤12 kW	Performance Requirements In Heating Mode, the Seasonal Coefficient of Performance (SCOP) should meet as a minimum:	Heating Mode: Commission Regulation (EU) No 206/2012 Annex II, table 1, average rating conditions [C. 31]			
		- Single split (non-VRF) heat pumps SCOP-2.20	Cooling Mode: Commission Regulation (EU) No 206/2012 Annex II, table 1 [C. 31]			
	Performance Requirements	•Multi-split (non-VRF) heat pumps SCOP≥4.10				
		•VRF heat pumps SCOP≥4.30		√ • •		$\checkmark$
		In Cooling Mode, the Seasonal Energy Efficiency Ratio (SEER) should meet as a minimum:				
		•Single split (non-VRF) heat pumps SEER≥6.40				
		•Multi-split (non-VRF) heat pumps SEER≥6.30				
	Air to Air Heat Pumps: Packaged (Rooftop)	<ul> <li>•VRF heat pumps SEER≥6.50</li> <li>In Heating Mode, the Seasonal Space Heating Energy Efficiency (ns,h) should meet as a minimum:</li> </ul>	Heating Mode: Commission Regulation (EU) No 2281/2016 Annex III, tables 16, 21, 26, average rating conditions [HP.22]			
	All to All fleat rumps. Fackaged (Noortop)	<ul> <li>Packaged heat pumps ns,h≥135%</li> </ul>				
	Performance Requirements		Cooling Mode: Commission Regulation (EU) No 2281/2016 Annex III, tables 16, 27, average rating conditions [HP.22]	√ • •		$\checkmark$
		In Cooling Mode, the Seasonal Space Cooling Energy Efficiency (ns,c) should meet as a minimum:				
	Air to Water Heat Pumps	<ul> <li>Packaged heat pumps ns,c≥145%</li> <li>In Heating Mode, the Seasonal Space Heating Energy Efficiency (ns,h), should meet as a minimum:</li> </ul>	Heating Mode: Commission Regulation (EU) No 813/2013, Annex III Tables 4 and 5 and Table 3 [HP.4]			
		•Low-temperature heat pumps qs,h≥155%				
GOBACK	Performance Requirements	<ul> <li>Medium and high-temperature heat pumps qs,h≥130%</li> <li>Large irreversible heat pumps qs,h≥125%</li> </ul>	Cooling Mode: BS EN 14825:2016 Table 4, Part load condition A, cooling floor application [HP.23]			
		In Cooling Mode, the Seasonal Energy Efficiency Ratio (SEER), for average climate conditions where the product is designed to provide cooling, should meet as a minimum:		✓ ✓ •	$\checkmark$	$\checkmark$ $\checkmark$
		Low-temperature heat pumps SEER≥4.50     Modium and high temperature heat numps SEER≥4.50				
		•Medium and high-temperature heat pumps SEER≥4.50 •Large irreversible heat pumps SEER = N/A				

24				New build	Refurb	Listed	Residential	Commerciai Public (e.g. Schools)
	Requirements	Performance Requirements	Measurement Standards / Test Conditions	As	set Typ	pe	Buildi	ng Type
	Category / Sub-category	Performance standards and specifications from industry standards, regulations and guidance to set the CoLC Standard						
	(Ground Source) Water to Air Heat Pumps: Split (non-VRF), Multi-split (VRF) Performance Requirements	In Heating Mode, the Seasonal Space Heating Energy Efficiency (ηs,h) should meet as a minimum: ●Single split (non-VRF) heat pumps ηs,h≥165% ●Multi-split VRF heat pumps ηs,h≥170% In Cooling Mode, the Seasonal Space Cooling Energy Efficiency (ηs,c) should meet as a minimum:	Heating Mode: Commission Regulation (EU) No 2281/2016 Annex III, tables 19, 21, 26, water rating conditions [HP.22] Cooling Mode: Commission Regulation (EU) No 2281/2016 Annex III, tables 19, 27, ground coupled rating conditions [HP.22]		•	•		✓ ✓
GO BACK	(Ground Source) Water or Brine to Water Heat Pumps Performance Requirements	<ul> <li>Single split (non-VRF) heat pumps ns,c≥270%</li> <li>Multi-split VRF heat pumps ns,c≥280%</li> <li>In Heating Mode, the Seasonal Space Heating Energy Efficiency (ns,h) should meet as a minimum:</li> <li>Brine to water heat pumps ns,h≥175%</li> <li>Water to water heat pumps ns,h≥185%</li> <li>In Cooling Mode, the Seasonal Energy Efficiency Ratio (SEER), for average climate conditions where the product is designed to provide cooling, should meet as a minimum:</li> <li>Brine to water heat pumps SEER≥5.0</li> <li>Water to water heat pumps SEER≥5.0</li> </ul>	Heating Mode: Commission Regulation (EU) No 813/2013, Annex III, table 3 [HP.4] Cooling Mode: BS EN 14825:2016 Table 5, Part load condition A [HP.23]	•	•	•	√	✓ ✓
	Boilers Performance Threshold	Building Regulations: Part L1 requirements:         Minimum efficiencies for gas-fired heating systems in new residential:         •Wet heating (e.g. radiators or underfloor heating): 92%         Minimum efficiencies for gas-fired heating systems in existing residential:         •Wet heating (e.g. radiators or underfloor heating): 92%, or in exceptional circumstances in existing residential, SEDBUK 2009 efficiency (78%)         Building Regulations: Part L2 requirements:         Minimum natural gas boiler seasonal efficiency (gross calorific value) in new non-domestic buildings:         •Single boiler >2MW output: 93%         •Nultiple boiler: 88% for any individual boiler and 93% for overall multi-boiler system         Minimum natural gas boiler seasonal efficiency (gross calorific value) in existing non-domestic buildings:         •Single boiler >2MW output: 93%         •Nultiple boiler: 88% for any individual boiler and 93% for overall multi-boiler system         Minimum natural gas boiler seasonal efficiency (gross calorific value) in existing non-domestic buildings:         •Single boiler +2MW output: 88%         •Single boiler seasonal efficiency (gross calorific value) in existing non-domestic buildings:         •Single boiler seasonal efficiency (gross calorific value) in existing non-domestic buildings:         •Single boiler +2MW output: 88%         •Single boiler >2MW output: 88%         •Single boiler +2MW output: 88%         •Single boiler +2MW output: 88%	Building Regulations Conservation of fuel and power: Approved Document Part L1 [GN.1] - As defined by ErP Building Regulations Conservation of fuel and power: Approved Document Part L2 [GN.2] - The minimum efficiencies are based on documented manufacturers' test data. Equations 6.1 to 6.6 of Part L2 should be used. Efficiencies based on net calorific values should be converted to gross calorific values based on, using the appropriate conversion factor in the Standard Assessment Procedure version 10 Table E14 [GN.4]		V	•	~	× •
	Gas-fired Performance Requirements	The gross thermal efficiency at test points should meet the Part L requirements as a minimum.	See above.	~	$\checkmark$	•	$\checkmark$	$\checkmark$ $\checkmark$
	Electric Boilers Performance Requirements	Electric boilers are around 99-100% efficient	N/A	$\checkmark$	$\checkmark$	•	$\checkmark$	✓ ✓
	Hybrid / Bivalent systems Performance Requirements	See performance requirements for heat pumps and boilers.	N/A	~	$\checkmark$	•	$\checkmark$	√ √
	Electric Convectors Performance Threshold	Building Regulations: Approved Document L2 states that Electric resistance heating is assumed to be 100% efficient, therefore no minimum efficiency is set for these types of system.	Building Regulations Conservation of fuel and power: Approved Document Part L2 [GN.2]	~	$\checkmark$	$\checkmark$	√	V V
	Electric Convectors Performance Requirements	100% efficient at point of use	N/A	~	$\checkmark$	•	$\checkmark$	v v
	Radiant heating Performance Threshold	Building Regulations: Approved Document L2 Requirements:         Heat generator seasonal efficiency should meet (net calorific value):         •Luminous radiant heater – un-flued: 86% thermal and 55% radiant         •Nonluminous radiant heater – un-flued: 86% thermal and 55% radiant         •Non-luminous radiant heater - flued: 86% thermal and 55% radiant         •Non-luminour radiant heater - flued: 86% thermal and 55% radiant         •Multi-burner radiant heater: 91% thermal	Building Regulations Conservation of fuel and power: Approved Document Part L2 [GN.2]	~	√	√	~	✓ ✓
	District Heating Performance Threshold/ Requirements	There are no specific performance thresholds for district heating. However Building Regulations: Approved Document L2 Requirement Part L Requirements states that an existing district heat network that is being connected to a new residential building should not have a CO2 emission factor for delivered heat to the residential building which is greater than 0.350kgCO2/kWh or a primary energy factor for delivered heat to the residential buildings, this should be calculated using SAP 10 or taken from the Product Characteristics Database.		~	$\checkmark$	$\checkmark$	√	V V

1	1	2

			New build	Refurb	Listed	Residential	Commercial
Requirements	Performance Requirements	Measurement Standards / Test Conditions	As	set Type	2	Build	ling
Category / Sub-category	Performance standards and specifications from industry standards, regulations and guidance to set the CoLC Standard						
Future Heating Hydrogen Performance Threshold	There are no currently published performance thresholds for hydrogen heating plant.		√	√	√	√	V
<b>Hydrogen</b> Performance Threshold/ Requirements	Performance requirements on the use of hydrogen currently not available. Key areas of performance will be related to conversion in electrolysers, hydrogen purging, tightness and material compatibility, combustion efficiency of boilers, fuel cells and electrolysers, hydrogen installation ventilation and flues, hydrogen pipe sizing and pressure drops, metering and storage and use with new generation plant In order to assure that hydrogen is compliant as a low carbon fuel, producers (and subsequently uses) of low carbon hydrogen must be able to report a GHG emissions intensity of 20gCO2e/MJLHV of produced hydrogen or less. GHG contributions are defined in terms of grams of carbon dioxide equivalent per megajoule of produced hydrogen at lower heating value (gCO2e/MJLHV). [FH9] The UK Low Carbon hydrogen standard outlines the calculations required to meet these targets	BEIS UK Low Carbon Hydrogen Standard Guidance on the greenhouse gas emissions and sustainability criteria 2022 [FH.9]	V	V	J         J         J           J         J         J           J         J         J	~	
Blended natural gas Performance Threshold/ Requirements	Performance requirements as per natural gas fired boilers. as and when new standards are released, these should be followed in addition to existing part L requirements	BSI PAS 4444 is a new standard aimed at standardising hydrogen gas appliances. New boilers should be manufactured to this standard and guidance updated as this document is amended in the future It also covers the setting of limit (upper and lower) hydrogen supply pressures and limit voltages. It discusses the possible arrangement of fittings and devices acknowledging the application to hydrogen fired appliances. [FH8]	~	~	√	$\checkmark$	`
Low Carbon CHP Performance Threshold/ Requirements	Building Regulations: Approved Document L1 Requirements: (Residential)         The heating plant emission rate of the micro combined heat and power system (micro-CHP) should be no greater than the emission rate of a regular boiler using the same fuel as the micro-CHP.         The heating plant emission rate should be calculated using all of the following:         a)The method in DEFRA's Method to Evaluate the Annual Energy Performance of Micro cogeneration Heating Systems in residential buildings.         b)The performance data for the micro-CHP packaged according to BSI PAS 67.         c)A plant size ratio that uses the nominal heat output of the heating plant divided by the average heat loss of the building when there is a temperature difference of 24.2°C.         Building Regulations: Approved Document L2 Requirements: (Non-Residential)         CHP plant should, under annual operation, have both of the following:         a)A minimum CHPQA quality index (QI) of 105.         b)Power efficiency greater than 20%.         Calculations should take account of the annual average performance of the whole system, including the distribution circuits, all heat generating plants, combined heat and power (CHP), and any waste heat recovery or heat dumping         Refer to Quality Assurance for Combined Heat and Power -The CHPQA standard Issue 8 for guidance on calculating CHP quality Index [FH 1]	Building Regulations Conservation of fuel and power: Approved Document Part L1 [GN.1] Building Regulations Conservation of fuel and power: Approved Document Part L2 [GN.2] Building Regulations: National Calculation Methodology (NCM) Modelling Guide [FH13] CHPQA standard Issue 8 [FH1] BSI PAS 67: (2008) [FH12]	~	V		✓	~

GO BACK

>

			New build	Refurb Listed	Residential	Commercial Public (e.e. Schools)
Requirements	Performance Requirements	Measurement Standards / Test Conditions	Ass	et Type	Bui	Iding Type
Category / Sub-category	Performance standards and specifications from industry standards, regulations and guidance to set the CoLC Standard					
Domestic Hot Water						
Domestic Hot Water System Performance Threshold	Building Regulations: Approved Document L2 2021 Requirements (Non-Residential) heat generator seasonal efficiency (gross calorific value): Direct-fired:- • Natural gas = 91% • LPG = 92% Indirect-fired:- • Natural gas, LPG & Oil = 91%	Building Regulations Conservation of fuel and power: Approved Document Part L1 [GN.1] Building Regulations Conservation of fuel and power: Approved Document Part L2 [GN.2]	V	√ √	~	√ 、
Centralised System: Gas-fired condensing water heaters ≤400kW Performance Requirements	Electrically heated = 100% assumed Water Heating Energy Efficiency (ŋwh) should meet: •3X5-L ≥ 70% •XL ≥ 80% •XXL-4XL ≥ 85%	Load profile Load profile is a given sequence of water draw-offs, as specified in Annex III, Table 1 of Commission Regulation (EU) No 814/2013 "Eco-design requirements for water heaters and hot water storage tanks" - this relates to the 3XS-4XL of the boilers. [CHW.12]		√ √	~	~
Centralised System: Gas-fired condensing water heaters >400kW Performance Requirements	For non-storage - instantaneous type, gross thermal efficiency should meet: •At 100% load, flow return temperatures of 80/60 °C ≥ 85.6% •At 30% load, return temperature of 30 °C ≥ 93.7% For non-storage - circular type, gross thermal efficiency should meet: •At 100% load, flow/return temperatures of 80/60 °C ≥ 85.6% •At 30% load, return temperature of 30 °C ≥ 93.7%	For storage: BS EN 89:2000 [CHW.8], BS EN 89:2015 [CHW.9] For non-storage instantaneous: BS EN 303-3:1999 [B.5], BS EN 303-7:2006 [B.9], BS EN 15502-1:2012+A1:2015 [B.10], BS EN 15502-2-1:2012 [B.11], BS EN 483:1999+A4:2007 [B.7], BS EN 677:1998 [B.8], BS EN 26:1998 [CHW.10], BS EN 26:2015 [CHW.11] For non-storage circulator (or multi-pass) type: BS EN 26:1998 [CHW.10], BS EN 26:2015 [CHW.11]	V	√ √	V	~
Centralised System: Air to Domestic Hot Water Heat Pumps Performance Requirements	Water Heating Energy Efficiency (nwh) should meet: $L \ge 110\%$ $XL \ge 120\%$ $3XL \ge 125\%$ $4XL \ge 125\%$	Load profile is a given sequence of water draw-offs, as specified in in Annex III, Table 1 of Commission Regulation (EU) No 814/2013 - this relates to the L-4XL rating of the heat pumps. [CHW.12]	V	√ √	~	~
Centralised System: Hot water boilers Performance Requirements	For hot water boilers <70kW, the gross thermal efficiency should meet:	Equals the thermal efficiency of the heater (gross calorific value) when tested to BS EN 15502-2-1:2012 [B.6]	~	√ √	V	✓
Point of Use Heaters Performance Requirements	<ul> <li>Seasonal Space Heating Energy Efficiency should meet ≥93%</li> <li>Point of Use Heaters are assumed 100% thermally efficient in terms of conversion to heat within the building. However, heat can still be lost in both the unit/storage/distribution piping</li> <li>Maximum heat loss for hot water cylinders are given in Part L 2021 as [POU.3]:</li> <li>i.50 litres = 1.03 kWh/day</li> <li>ii.100 litres = 1.49 kWh/day</li> </ul>	g. BS EN 15450:2007 provides storage losses for storage vessels less than 200L. [HP. 21]	V	√ √	~	√ 、
Solar Hot Water Performance Threshold and Requirements	There are currently no requirements for solar thermal system in current building regulations. The supplier must provide the following parameters to comply: i. Active Area (m2) ii. Zero-loss efficiency iii. First-order Efficiency Coefficient (W/m2K) iv. iii. Second-order Efficiency Coefficient (W/m2K)	Solar collectors introduced to the market after 2017 must comply with BS EN ISO 9806:2017 "Solar energy. Solar thermal collectors. Test methods." [SHW.8]	•	•••		•••

1	Requirements Category / Sub-category Heating	Technical standards - For references, please refer to the 'Appendix' tab Further guidance on design considerations and how the technology category or sub-category should be installed to deliver the performance standard targets Key Design and Operation	s Considerations	Compatibility / Future proofing	- Environmental Impact	Paseri Quipa W Asset Type	Residential Commercial Public (e.g., Schools)	State         State <td< th=""><th>Project Management Mec hank al Engineer Set Kust Engineer</th><th>Electronic trageneer Architect Public Health Engineer</th><th>Rife Erguner Contractor Building FM / End User</th></td<>	Project Management Mec hank al Engineer Set Kust Engineer	Electronic trageneer Architect Public Health Engineer	Rife Erguner Contractor Building FM / End User
GOBACK	Air to Air Heat Pumps: Split, Multi-split, VRF and Packaged Heat Pumps	• The ASIP must be at least 1 metre from the property's boundary and the external unit car's protrude more than 1 metre from the outer wall, root, or chinney for residential developments (IPL3)]. • In Additive developments (IPL3)]. • A industry wall on of thum's to sale wall balling. Comunit mundulecturer to determine space requirements of practice barear barrows. • A industry wall on of thum's to sale wall balling. Comunit mundulecturer to determine space requirements of practice barear barrows. • A industry wall on of thum's to sale wall balling. Comunit mundulecturer to determine space requirements. • A industry wall on of the sale of the sale of the sale of the sale of the sale. This must adhere to BS EN 378 (IPL 1). • Mundulecturer will provide insurance to the Balling in a container with the EUF Gas Regulations S17/2014, including any additional 2017 requirements. • Sale advisor to require duterwork, and are easier to install. • Comminal Commission N-1 humber of the ageneration (Hearer N is the number of essare requirements and potentially improve seasonal efficiency (IPL3). • Instances to provide insurance to plant redundacy. A control strategy should be in place to ensure longevity of equipment and potentially improve seasonal efficiency (IPL3). • Instances advisored advisor of plant redundacy. A control strategy should be in place to ensure longevity of equipment and potentially improve seasonal efficiency (IPL3).	<ul> <li>A like bait heat pumpic an operate for cooling making them suitable for commercial buildings with cooling requirements</li> <li>CollS Goide A Poyness guidance on control strategy to ensure control of setpoints and avoid parallel heating and cooling of spaces with multiple index units. Next pumpic can be control strategy to ensure control of setpoints and avoid parallel heating and cooling of spaces with multiple index units. Next pumpic can be controlled controlled, combining multiple units, or individually with hand-help controllers (IPF 9.]</li> <li>Next exchanges table have a spacering marger 13-54 °C.</li> <li>Refur A Listed Considention: Costing buildings may require higher temperature due to heat losses, this can typically be small of 5 °C. This can be charged in the start perturbang strate heat parallel facts can log and charge in the start perturbang strate heat parallel facts can log and the start perturbang strate heat parallel facts can log and the start perturbang strate heat parallel facts can log and the start perturbang strate strategy and the start perturbang strate heat parallel facts can log and the strate strategy and the strate strategy and the strat</li></ul>	VVP: split & multi-split pumps require piping from the external condensor to the internal costents, so spatial assessment required.     Packaged heat pumps and heat pumps used in conjunction with AHX require decising. Consult GBE Guide 82 for spatial guidance (19-5).     These heat pumps can be used in conjunction with pass wet system and other heating solution, to provide the ecologing requirements of the specific building.     The contractor(designer shall assess the availability of the available electrical services, especially if part of a new build or retrofitting from a gath activity system.     Refurb & Listed Consideration: If retrofitting, the existing building may not have space allowance for ducting, this option may not be viable.     Conduct spatial requirement assessment.	consulted [0F.8], For determining external noise criteria, a 24-hour noise structure, which may superaided. This should set a project specific noise criteria, which may superaide the requestionness stot out in MSC assumed to the structure of the structure of the + Use refrigerants with a GNP of less than 5, or if feasible, use no refrigerants. Several BEEEAM credit can be obtained	J • •	J	I CACE Broad     Ia) Section M10: Equipment containing refrigerants     Street Place     must be labelled in accordance with the EU F-Gas     must be labelled in accordance with the EU F-Gas     must be labelled in accordance with the EU F-Gas     must be labelled in accordance with the EU F-Gas     must be labelled in accordance with the EU F-Gas     must be labelled in accordance with the EU F-Gas     must be labelled in accordance with the EU F-Gas     must be labelled in accordance with the EU F-Gas     must be labelled in accordance with the EU F-Gas     must be labelled in accordance with the EU F-Gas     must be labelled in accordance with the EU F-Gas     must be labelled in accordance with the EU F-Gas     must be labelled in accordance with the EU F-Gas     must be labelled in accordance with the EU F-Gas     must be labelled in accordance with the EU F-Gas     must be labelled in accordance with the EU F-Gas     must be labelled in accordance with the EU F-Gas     must be labelled in accordance with the EU F-Gas     must be labelled in accordance with the EU F-Gas     must be labelled in accordance with the EU F-Gas     must be labelled in accordance with the EU F-Gas     must be labelled in accordance with the EU F-Gas     must be labelled in accordance with the EU F-Gas     must be labelled in accordance with the EU F-Gas     must be labelled in accordance with the EU F-Gas     must be labelled in accordance with the EU F-Gas     must be labelled in accordance with the EU F-Gas     must be labelled in accordance with the EU F-Gas     must be labelled in accordance with the EU F-Gas     must be labelled in accordance with the EU F-Gas     must be labelled in accordance with the EU F-Gas     must be labelled in accordance with the EU F-Gas     must be labelled in accordance with the EU F-Gas     must be labelled in accordance with the EU F-Gas     must be labelled in accordance with the EU F-Gas     must be labelled in accordance with the EU F-Gas     must be labelled in accordance with the EU F	<i>y y</i>	<i>s</i>	s s
	Air to Water	panning requirementi. Assess suidole ocations to protect nerrage status of building.	radiators sized to operate at 6.55°C (101-64). The air group should not be expected above 55°C unless the application requires 1.61° and to water heat pump system superiod by designers to operative heat pumps suffered drops in efficiencies at these temperatures. The amounts the meta- angined source above 55°C, tails on temperature heat pumps suffered drops in efficiencies at these temperatures. The operative heat pumps the above 55°C, tails are supported to a flow temperature heat pumps must be eater pumps to a temperature. The flow of the pump results are pump and the pump results are pumps. The pump results are pump results are pump results are pump results are pump. The pump results are pum	consultant to confirm optimal solution of emitter alteration or additional plant to top up temperatures. M&E consultant to assess pipework alteration requirements. • The constant/of designer shall assess the availability of the available electrical services, especially flapt of a new build or retroliting from a gen horizing stratem. • The constant/of designer shall assess the availability of the available electrical services, especially flapt of a new build or retroliting from a service of the design and size of the availability of the available electrical services, especially flapt of a new build or retroliting from a an horizing havin. The design and size of a distant assess the proposed and emitters size for a maximum flow rate of 45°C and 55°C for commercial new builds, to ensure the future compatibility with low-temperature systems, like heat pumps (HP 2022). Refurb & Listed Considerations: heat Pump must be able to provide at least 1000 of the calculated heat loss without any supplementary heating, in older building, with loss: fabric, this heat loss must be considered [HP.7]. Refer to fabric Section for guidance on improving the thermal envelope of the building.		J J	× × ×	Street Place Meethanical Specification         must be ballefield in accordance with the EU FGas Meethanical Specification           2) City of London 20, Dity of London Housing Design Guide De 2020         2a) P60: Systems must be designed to the following Corporation Housing Design Guide De 2020         3a) P60: Systems must be designed to the following Corporation Housing Design Guide De 2020         3b) State State State State State State State State (State State State State State State State (State State State State State State State (State State State State State State State State (State State State State State State State State State (State State State State State State State State State State State (State State St	<i>y y</i>	J	J J
	Ground Source Water to Air Heat Pumpi: Split, Multi-split and VBF	<ul> <li>In the CBM muck be at least 1 meter from the property's boundary and the external unit car's portune more than 1 meter from the outer wall, root of running for reidential developments (IPL 33).</li> <li>A in instant (IPL 33).</li> <li>A in instant (IPL 33).</li> <li>A instant (IPL 34).</li> <li>A in</li></ul>	• Ground to set heat pumps can operate for cooling making them suitable for commercial building with cooling requirements. • CRSE Guide A provide suplance on operating temperatures in request to heat loss can set provide support of the temperature correct sing of MVAC systems. • Consult CRSE Guide A program is a strategy to ensure control of setpoints and word parallel heating and cooling of spaces with multiple indior units. Heat pumps can be control strategy to ensure control of setpoints and word parallel heating and cooling of spaces with multiple indior units. Heat pumps can be controlled certarily controlled, combining multiple units, or individually with hand heip controlled. [IP 3] Korg Consideration Can expend to the the correl the distribution temperature is to the ground temperature, the higher the COP. Therefore, as its survey should provide indication of whether the heat pump will perform adequately 1(# 216).	Packaged heat pumps and heat pumps used in conjunction with ANL's require ducting. Consult OBEG suice 22 for spatial guidance (HP 5). These heat pumps can be used in conjunction with gas wet systems and other heating solution, to provide the cooling requirements of the specific haiding. The contractor/designer shall assess the availability of the available electrical services, especially if part of a new build or retrofitting from a gas heating system. Open loss OBM's can have a hish pumping energy comparison, this can outweight some of the benefit of the hisher efficiencies over sin	consulted [IP #], For determining external noise criteria, a 24-hour noise survey's typically required. This should set a project specific noise criteria, which may suppressed the requirements set out in MC 300.		~ ~	1) GoL Grand     1) Section MD: Equipment containing refrigerants     Strete Place     Mechanics     Regulations 51//016., including any additional 2017     Specification     Regulations 51//016., including any additional 2017     Specification     Regulations 51//016., including any additional 2017     Specification     Research and the designed to the following     Corporation     Housing Design     Research least meeting requirements,     So 10342 (18), 2014, and SE N15540 (8), 2007,     undeffoor heating; BS IN 1264 and BS EN 1264-2     (BS, 2008).	<i>s s</i>	×	J J
	(Ground Source) Water or Brine to Water Heat Pumps		Key Consideration: As a general rule, the closer the distribution temperature is to the around temperature, the higher the COP. Therefore, a site survey	consultant to confirm optimal solution of emittre idention or additional plant to top up temperatures. M&E consultant to assess pipework alteration requirements. • The constructor/decigner shall assess the availability of the available electrical services, especially fast of a new build or retrolifting from a gran houring system. The plant set of the state of the state of the available electrical services, especially fast of a new build or retrolifting from a gran houring system. The plant set of the state of th			×	13 (GGL Broad 14) Section M10: Equipment containing refrigerants Strete Place Mechanical Specification 20 (Dty of Londo Corporation 21) (Cty of Londo 20) (Cty of	<i>× ×</i>	~	J J
GO BACK	Condensing gas-fired boilers	Installing, operating, services and replacing the burner(s), controls, flue way, waterways and any other parts that require regular attention. [B-1] The bole installand housing of cause adjuster space to execute their degis temperatures during operation of the boles. [B-1] * Boles shall only be shed on walks of floors capable of withstanding temperatures of at basis (SS cause) and so the sheet floor and their set [B-1] Lined Constraints: the instring spaces for the boles. whill one and the flue. The const of the disample value shall be basis and the termination may need to be painted so that their appearance blends in with the external fabric. An old chimney is a often a good place to run the flue in traditional buildings, although this may require the insertion of a flue liner. [B-3]	underfloor heating systems, can achieve assand efficiences over 50%. It is often possible to design in a particular low temperature circul (e.g., underfloor heating value) is walk to locate the acondary heat exchanger to promote conditionation. Some particular base and a base temperature efficiential (e.g. 21 of 21) to promote longer periods) in the condening mode. [B.1] used for fore condening bases in the download mode of the download of the download of the download of the download bases and the download of the download base condening mode of the download base condening bases and the download base condening mode download bases and the download base condening bases and the download base condening bases and the condening bases and the download base  condening bases and the download base condening bases and the comdening bases are condening bases and the condening bases are condening bases and the condening bases are condening bases and condening bases are condening bases and the condening bases are condening ba	Bollers with an output >1300W blood have both of the following: a. Optimum start(sp) control with effect in give starks. And/or fresh protection outside occupied periods. b. Either two-stage high/low finds facility in boller or multiple bollers with suggence control to provide efficient part-load performance. Bollers with an output of more than 5000M should have fully moultaing hourier controls to [8,4] • Compatible with all building types. • Compatible with all building types. • Lyphorgen Hore with gives control more than 5000 km and the should have fully moutput of the source at 20.80 hydrogen to gas mix. Buildings with these bollers will be able to make use of the existing plant if hydrogen is added to the fault mix.	<ul> <li>Combustion of focal fuels leading to climate change. New gas boilers will not be permitted in new buildings from 2005 and should be avoided for other projects where possible</li> <li>Combustion of focal fuels constraints and a solution of the solution o</li></ul>	J J •	s s s	LOCC Air La) P48.All gas bollers will be required to have a NOx Duality Strategy and CompRoVAVM at OX 02 as a minimum. 2015-2024 Under for typitenei these limits by 2020 will be kept under review.		,	3-3
		<ul> <li>No flue required as no combustion of fossil fuels.</li> <li>Electric boilers have greater freedoms of installation locations than fossil fuel fired boilers.</li> </ul>	<ul> <li>Lettric bollers are allest and require minimal servicing.</li> <li>Lettric bollers are allest and require minimal servicing.</li> <li>Lettric bollers are allest and requires the dentities should be kined to allow the space heating system to operate effectively and in a manner that meets the heating needs of the durating, at a maintum flow tensor that or dollars the system in newly installed, or fully replaced in a manner that meets the heating needs of the durating, at a maintum flow tensor tensor of 59x11.</li> <li>Kerg Consideration: The new requirements of 59x11. State that where a wet system is newly installed, or fully replaced in an existing building, all parts of the system including pipework and emitters should be lated to allow the space heating system to operate effectively and in a manner that meets the heating endor dive denting, at a mainter that meets the heating endor dive denting, at a mainter that meets the heating endor dive denting, at a mainter that meets the heating endor dive denting, at a mainter that meets the heating endor dive denting at a mainter that meets the heating endor dive denting at a mainter that meets the heating endor dive denting, at a mainter that meets the heating endor dive denting at a mainter that meets the heating endor dive denting at a mainter that meets the heating endor dive denting at a mainter that meets the heating endor dive denting at a mainter that meets the heating endor dive denting at a mainter that meets the heating endor dive denting at a mainter that meets the heating endor dive denting at a mainter that meets the heating endor dive denting at a mainter that meets the heating endor dive denting at a mainter that meets the heating endor dive denting at a mainter that meets the heating endor dive denting at a mainter that meets the heating endor dive denting at a mainter that meets the heating endor dive denting at a mainter that meets the heating endor dive denting at a mainter that meets heating endor dive denting at a mainter</li></ul>	a System should both: Lives from temperature control El be capable of modulating the power input to the primary water depending on space heating conditions El ming and temperature demand clausible be provided. c) If the building has a floor area greater than ISGn2, heating should be split into different heating zones and each zone should have separate controls for timing and temperature demand [8.4] Heatric builties are an opennive way to heat a space in comparison to an air source heat pump, which may be more than 3k more efficient,	<ul> <li>Electric ballen can produce has impact on the environment than other heading systems.</li> <li>No direct emission of greenhouse gases or air pollutants, however, still consumes electricity from the national grid.</li> </ul>	J J •	× × ×	1) City of London Nucle - Whole Nates- Whole Ulgraving Advice Digitatory energy radig closure, that adaps with Nates EV LSC, scaring with all offices greater than Ubgrave Carbon Diplomeeting (March 2022) whole with energy efficient electric alternatives is a wystems with energy efficient electric alternatives is a emissions.	<i>y y</i>	J	J J

Page 427

	Requirements	Technical standards - For references, please refer to the 'Appendia' lab				Patra Gungaa Hasset Type	Residential Commercial Public (eg. Schools)	so provide the solution of the	Project Management Mechanical Engineer A Electrical Engineer	Activities of the second secon
	Category / Sub-category	Further guidance on design considerations and how the technology category or sub-category should be installed to deliver the						Task Bar PPG Activities		
GO BACK	Circles () / Sub Kinger) Hybrid Systems	performance standard targets Place refer to be juint requirements to heat pumps and bolies. CBBS AMD1 [VT3] (an be used as a guidance to the hourly load model can help in understanding the impact of different secondary heat source sizes when considering factors such as: • Capacity/cost/availability constraints: • Whole Hig candom considerations • A heat pump that is sized for a load that is only likely to be exceeded for a certain proportion of hours or when the ambient temperature exceeds or fails below a certain temperature • The level of uncertaintry in loads since an undersized heat pump will lead to over-reliance on secondary systems.	Decisions must be made on whether the heat pump will controlled in Concurrent or Sequential Operation.     Some must be made on whether the heat pump will controlled in Concurrent or Sequential Operation.     Some must be made on whether the heat pump sub a which is be peratural will be the decision of the second temperature as the theory pump sub and which the operatural will be the decision of the second temperature as the theory pump sub and which the operatural will be the decision of the decision of the decision of the second temperature as the second temperature as the second temperature as the second temperature and the decision of the second temperature as the second temperature as the second temperature and the second temperature and the second temperature and temperature and the second temperature as the second temperature and temperate and temperature and temperature and temperature and temperatur	heating publiclion without gas or electric secondary system Key Metu-byListed Consideration: Can work with existing emitters as boilers can be used to top-up flow temperatures.	• Hybrid systems offer the opportunity for important efficiency gains and emission reduction from heating in existing and new commercial premises, however, it is not a long term solution for decarbonation if the other heat source is a foul fuelled boler. • If the UIt has contributions from hydrogen then, Hybrid heating could have long term potential.	J J .	J J J	JO City of London     Si UK Government is proposing to introduce a new     delays voltage of the second secon		
	Electric Convectors	This system does not require a central plant. Due to this, the system may be suitable for desians with limited plant space.	The system design should incorporate heat loss into design calculations. Heat loss calculations for the building based on BS EN 12831-1 [EC.1] and	The system can be installed aloneside other HVAC systems, ensurine that there is enough space and electrical capacity prior to design and	Electric convection heaters can produce less impact on the environment than other heating systems.			1) City of London 1) UK Government is proposing to introduce a new		
	Electric Convectors	The equipment test must comply with EcoDesign, Lot 20 legislation, which requires electric heaters to have electronic thermostats with a 24-hour, 7 day timer with either adaptive start or an open window sensor.	CRBES Guide B1 [C.2] • It should ensure that the room in which it will be in is heated to the design set-point. Varied heating and output rates can occur dependent on design and manufacturer. This can also be controlled with a time or thermostat. • If installing as a readement of a non-electronically fuelled heating system, consult with local utility provider to determine if sufficient capacity is electricity is available.	installation.	<ul> <li>No direct emission of greenhouse gases or air pollutants, however, still consumes electricity from the national grid.</li> </ul>	J J •	J J J	Planning Advice obligatory energy rating disclours, that aligns with Note-Whole MARES US, starting with all offices greater than Ullecycle Carbon 1,00m2, from 2022/23. Substituting gas fired heating plannesing systems with energy efficient electra clanations is a (March 2022) very effective way of reducing operational carbon emissions.	5-5	5 55
	Radiant heating									
	High Temperature Radiant Heaters	•No central plant required for high temperature radiate thaters. Howeve, there are mouthing requirements: oblicating Linke heatings may be mouthed and heating between 32 and 20 min and we mouth used for general area heating, rather than local spot heating. Low-level mounting of these units is available to ensure even distribution of heat. [R412] does not be a set of the br>does not be a set of the set of	Kunface temperature (or direct gas fired tubule heaters are around 500°C, temperatures for direct gas fired radiant plaque heaters around 800°C, and the fainant in electric quark heaters operates at temperatures endering. Store: «If installing electric quark heaters around an electric state of a fausil kelled heating system, consult with local utility provider to determine if sufficient electrical quarks in a vanishie. Building Type Consideration: This system is most suited to logistics and industrial applications.	<ul> <li>Interministration: our to no moving part the borging of each heating septon.</li> <li>Interministration: our to no moving part the borging of each heating septon.</li> <li>Temporative count of the overall system.</li> <li>Black-bulb radiant heat sensors should be used to achieve good temperature control of the system and should be positioned representatively of the radiant effect of the panels. See the AD L2 for the minimum controls package.</li> </ul>	High-temperature heaters must not be placed where they could give flammable dust or vapours or decompose vapours into toxic parameters must be located with recommended destances to ensure proper had stabilition. Streef materials must be located and the strengts to avoid bot open. Follow manufacturer's recommendations.	J J	J		<i>s s</i>	
GO BACK	Low Temperature Radiant Panels	<ul> <li>Now temperature hot water radiate panels require a control al plant to provide hot water to the panel, typically between 30 and 70°C, this may be supplied by gas or electric bolling, whet papels, and can be linked to each other with pipework plane by push-fit fields/b notes.</li> <li>These panels are beaufable in a variety of shapes and sizes, typically rading from widths of 200mm to lengths of 9,000mm, weighing approximately 15% per sq. m. [Note that will place a variage water temperature and a 'soon temperature' to enable their equipment to be sized. [54:3]</li> <li>Electric infrared radiant panels do not require any central plant.</li> </ul>	temperatures around 90°C.	• Temperature control is required for each heater, or group of heaters, and time control for the overall system. • Sidex-bub radius that best senses should be used for a value good temperature control of the system and should be positioned representatively of the radiust effect of the panels. [84:3] • Electric radiust heaters should have a value is an opposing maintenance or servicing. • Electric radiust heaters should have a values it zone or concupancy control through presence detection. [84:4]	•Redient coch heating and coning in large undivided areas with variable occupancy patterns provides localized heating just where and when people are working, which reduces the heating cost.	J J J	s s s			
	District Heating	The Heat Networks Code of practice (CP1 2020) [DH.2] contains guidance and an exhaustive list of all the technical standards and requirements for the design,     define a merceline of a division external field line and existence of the standards and requirements for the design.	CP1 2020 [DH.2] provides specific guidance for the specification, design, installation and commissioning of the district heating systems.	An assessment for the connection to Otigen heating and cooling network should be undertaken as part of the optioneering assessment for     any lot of an exclusion because where an investore and and a second						
	District Heating	elievry ad operation of a district heating network, including all plant and equipment in the centralized heat entry centre, the piping network tabling interesting technologies. (P1 2000 hold be referred to a the central source for all technologies (P1 2000 hold be referred to all technologies (P1	to maintain the overall balance in the network and to avoid excessive pumping energy. • For new district heat networks or community heating systems, the domestic hot water system should have variable volume controls to maintain low	a new build or refurbishment project where relevant.	carbon intensity of the heat network (IgCO2/WH) is an important comparable metric to ensure the building project will be on course to achieve net zero targets.	5 5 5	5 5 5			

	Further guidance on design considerations and how the technology category or sub-category should be installed to deliver the			
Category / Sub-category	Purcher guidance on design considerations and now the technology category of sub-category should be installed to deliver the performance standard targets			
Future Heating	Key Design and Operation	Considerations	Compatibility / Future proofing	Environmental Impact
Hydrogen		r Considerations		en moninentar import
Hydrogen	Storage: • For outdoor installations weather protection may be required. Hydrogen storage cylinders and vessels located outdoors need to be protected from extreme	outdoor operation, the ambient temperature range, and the barometric and humidity specifications. [FH10] • The manufacturer shall specify, as outlined in IEC 60204-1, the electrical input rating for the hydrogen generator in volt-amperes (VA) or watts (W) and		The hydrogen generator shall be suitable for the intended installation environment as classified in IEC 60539. Where a hazard from ingress of solid foreign objects and/or ingress of water exists, as a minimum the hydrogen gene a) meet the P32 rating as defined in IEC 60559 for indiox; related use b) meet the P34 rating as defined in IEC 60559 for indiox; related use c) meet the P44 rating as defined in IEC 60559 for indiox; related use c) meet the P44 rating as defined in IEC 60559 for objects and/or ingress of water exists at hydrogen and oxygen vents, the rating as defined in IEC 60559 [Pitt0]
Blended natural gas	<ul> <li>CBIS guide A gives guidesce on bolier plots sing, this is largely dependent on building characteristics and text lose for such building. The start of hext lose is require to be colasterat along with other factors is correctly determine the sea of the baller guide. The start of hext lose is Reference Standard for buy pressure hydrogen utilisation -iECM/N/1 with amendments June 2022 tests as a reference document in understanding hydrogen application in domestic buildings and smaller nondomestic buildings. It discusses safety, material selection and comparisons between natural gas and hydrogen. This should be referred to assist with plunt design. [PNJ]</li> </ul>	Please refer to Gas find Boller standards	<ul> <li>Compatible with all building types - hydrogen ready boilers should be preferred when new installation is undertaken - ensuring compliance with Part L building regulations</li> </ul>	
Low Carbon CHP	<ul> <li>Ar/s inspired in the engine for combastion, general cooling and verifiation. The supply of cooling and combustion air may be statisfied using either common or separate systems.</li> <li>The plant room must have sufficient statula ventilation. The case of larger engines, separate firsh air supply ducting may be required in order to obtain sufficiently cool combustion air (targer poor output fails as charge are timeperature increase. Cern must, therefore, beakes with the isotation of combustion air instale. [1946]</li> <li>Electrical Connection:         <ul> <li>The GPU end spectra distribution of a status and provide the status and provide and and provide the status and provide and and provide the status and provide to a status and provide to a status and provide to a status effect on an existing bus are or new bas section.</li> <li>The GPU end spectra of the public electricity supply cartical point bus connecting a generator to any part of the public electricity duping the public electricity supply cartical in Electricity Association publication. When connecting a generator to any part of the public electricity duping the total bitribution. Network Operator (DNI) by following the GSG connection: Connect the CP duping total or distribution networks, you may apply to the local bitribution. Network Operator (DNI) by following the GSG connection procedure. [NE1]</li> <li>Dahats dynamic. Contract in public and end to contra the status and end and any end to a contract on production. There are no end to a contract on an ensure that any again and the end on contract generator to any part of the public electricity duping and insulation returnes any to the local bitribution. Network Operator (DNI) by following the GSG connection producture. [NE1]</li> <li>Dahats dynamic are often to contend in the status or producture and the contract duping the status and the public electricity association bubblic and productin the bubblic or engine that a spectros. C</li></ul></li></ul>		utilite hydrogen as and when this becomes readly available into the market. - OF CP can work alonging either remevable technologies and energy storage as spart of a hybrid energy solution. Gas engines can be adapted to run on remevable fuels such as hydrogen as they become more viable, meaning investments can be made safely for new or existing facilities.	HOL emissions should be in line with BREEAM Pol 2 requirements [PHS]     exceptions and their availances will generate noise that must be attenuated to acceptable levels. The de- degreed on the target million of noise to be achieved: in plant room         in adjacent armo must notificat are short possible and be to provide noise data for the units which are external to the accountic enclosures and the terminations. Most small-scale CPP units will be subplied within acoustic enclosures, which in many cases will be addregated noise targets [PI66]





GO BACK

	New build	Refurb	Listed	Residential	Com merci al	Public (e.g. Schools)	City of London Documents and Guidance	Loc ation and Description	Project Management	Mechanical Engineer	Electrical Engineer	Architect	Public Health Engineer	Fire Engineer	Contractor	Building FM / End User
	As	set T	ype	Buil	ding 1	Гуре	City	of London Document Interlinks (TBC)			Key	Stak	ehold	ers		
							Task Bar	PPG Activities								
Executive publication, Health and ode of Practice and guidance on ets the requirement of the Health to achieve the BREEAM credits is include [CHW.7]:	V	J	V	~	~	J		14/2-66:		~	~	~	~		~	~
in of potable water in sanitary clude showers. Refer to the stic hot water systems [POU.1]. cation for safety of household	1	1	1	1	1	~	Corporation Housing Design	Instrumeneous generated Domestic Hot Water Instantaneous generated Domestic Hot Water (DHW) systems (combi-boilers or Hydraulic Interfrace Units (HU ¹ 3)) are preferred to indirect systems with storage. The minimum DHW generation temperature shall be 50°C, the designer is required to document the approach taken to mitigating the risks of legionella.		2	~	√	~		V	~
mission for the installation of the use not more than 1m from the sawill not be permitted on the						•	Guide Dec 2020	OHM damage must be >60°C DNW distribution piecens's table text possible to prompt delivery of hot water, (<30a).     Ihermostatic mixers are required on all showers and baths.		2	~	v	~		V	~

### COOLING

#### **Overview**

Cooling is a process of removing heat from internal spaces and rejecting heat to external ambient air or rejecting to local waste heat reuse systems. The systems shall be sized to ensure suitable internal temperature and humidity are maintained, and minimise the energy required to cool the spaces. There are different types of cooling equipment available on the market using different heat transfer mediums to transfer heat from internal to external. Some systems allow designers to adopt combinations of different indoor cooling unit types, whereas others are restricted by the choice of the external units.

Large full building cooling systems generally warrant the use of a central cooling plant and circulate water (which is cost effective and flexile for easy future adaptation) requiring large central plant areas and regular maintenance. These systems (Air Cooled Chillers, Water Cooled Chillers and Cooling Towers) should be considered if there is space available to house roof top equipment (Air Cooled Chillers and Cooling Towers) and internal central plumbing plant and riser pipework to distribute water to areas requiring cooling. Water Cooled Chillers can be housed in internal plant rooms and used with Cooling Towers or alternative waste heat systems to reject heat into.

Smaller refrigerant systems such as DX (Direct Expansion, single split), VRF and Hybrid VRF Systems which are generally smaller but easily scalable should be considered for areas where refurbishment works are confined to specific areas, the building is to be phased or house multiple tenants where sharing cooling systems are not acceptable. These units have restricted choice of internal in-room cooling equipment options and shorter operating life, however, are cheaper, lower maintenance and easy to install and replace. Only VRF and HVRF systems allow for concurrent heating and cooling in the areas served between each individual unit, and HVRF systems allow for a mixture of water to permit greater choice in indoor units to be selected and minimises the amount of refrigerant used.

#### Interdependencies

There are several interdependencies between cooling requirements and other building services and fabric. These interdependencies are that cooling needs to link with building controls for efficient operation and prevent simultaneous heating and cooling; where feasible the consideration of re-use of waste heat from cooling plant; cooling flow and return temperatures will impact on the design of cooling distribution systems and where ventilation systems; improvements in lighting will reduce cooling loads in a building and improvements to building fabric or solar shading will reduce cooling requirement.

Further calculations shall be undertaken to avoid oversizing equipment with respect to the other building services and fabric.

#### Water-cooled Chillers

Water cooled chiller is a type of refrigeration system which uses water as a secondary refrigerant. Heat is transferred from one closed water circuit to another, where the later circuit is at elevated temperatures. This is achieved through a refrigerant circuit where refrigerant in a liquid phase absorbs heat from a cooler water source and rejects heat as a liquid refrigerant to a warmer water source. They are used for larger, more complex, heating, ventilating, air conditioning, and refrigeration (HVACR) applications.

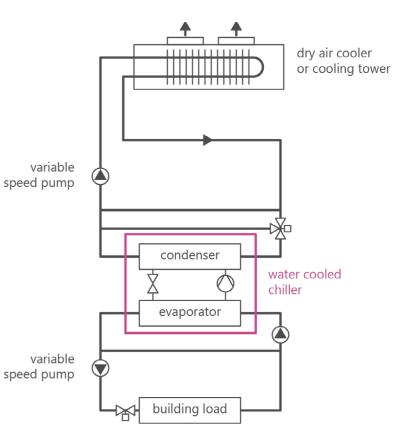


Figure 22 Example schematic of Chiller coupled with Dry Air Cooler or Cooling Tower Heat Rejection Plant

#### Cooling Tower

A cooling tower is designed to remove heat from a building or facility by spraying water down through the tower to exchange heat with the inside of the building. Air entering from the sides of the tower passes through the falling water where it exchanges heat and some of the water evaporates. Heat and evaporated water flow out the top of the tower in the form of a fine cloud-like mist. The cooled water can then be returned to the building to absorb heat for the spaces.

#### **DX Split Systems**

A DX (Direct Expansion) unit is a cooling system comprising an outdoor condenser unit where air passes over hot gas refrigerant and rejects heat to the passing air flow. This results in a cold liquid phase refrigerant medium to serve a single indoor unit (in a single split system) or multiple units (in a multi split system). Units usually only provide cooling and are not configured to provide heat recovery between spaces (unlike VRF or reverse cycle units). Indoor units operate with fixed refrigerant coil temperatures, with indoor cooling intensity controlled via airflow at the terminal (Fan Coil Unit) level.

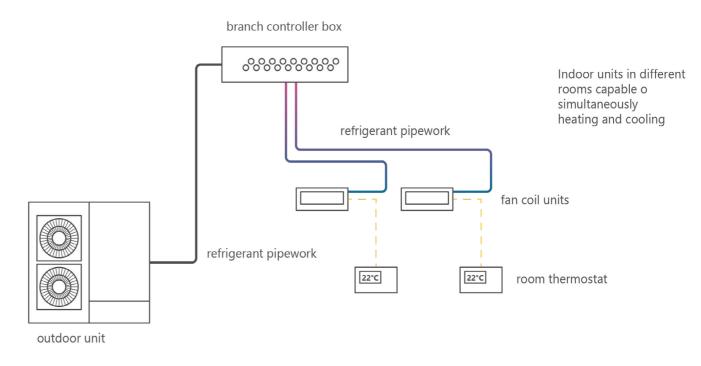


Figure 23 Example schematic VRF Cooling System

VRF Systems are systems comprising multiple indoor units served and connected to an outdoor unit. Air is rejected or absorbed by air flow passing over finned tubing containing refrigerant and changing the refrigerant's phase. As VRF units are generally fitted with reverse cycle valve arrangements, the systems allowing heating or cooling by reversing the flow of refrigerant, thereby controlling if the outdoor unit rejects and absorbs heat. A control system monitors the indoor set point, room temperature, and adjusts the direction and flow of refrigerant among indoor units to satisfy the temperature requirements of each space.

#### Hybrid VRF Systems

Hybrid VRF Systems are systems comprising multiple indoor units served and connected to an outdoor unit. Air is rejected or absorbed by airflow passing over finned tubing containing refrigerant and changing the refrigerant's phase. As VRF units are generally fitted with reverse cycle valve arrangements, the systems allow heating or cooling application by reversing the flow of refrigerant, thereby controlling if the outdoor unit rejects and absorbs heat. However, different from a standard VRF unit, a Hybrid VRF unit uses less refrigerant, with termination to a heat exchanger system that exchanges the heat locally to a heat exchanger, and then uses circulating water to serve multiple indoor units.

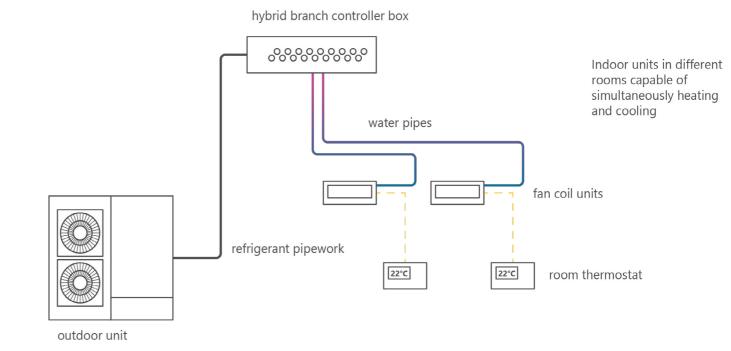


Figure 24 Example schematic hybrid VRF system

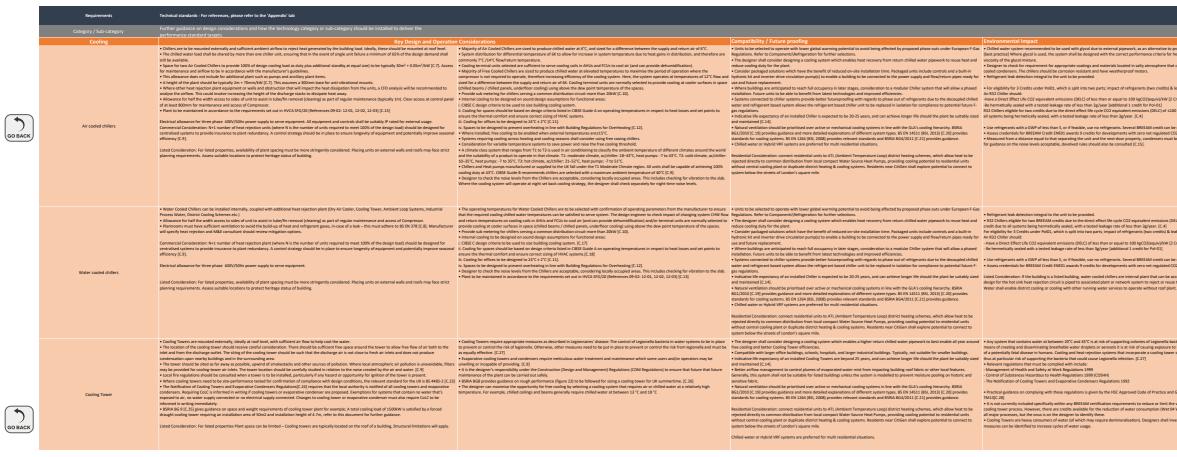
### **TECHNOLOGY GUIDE - PERFORMANCE STANDARDS**

135				New build	Refurb	LISTED Recidential	Commercial	Public (e.g. Schools)
	Requirements	Performance Requirements	Measurement Standards / Test Conditions	Ass	set Type	B	Building	Туре
	Category / Sub-category	Performance standards and specifications from industry standards, regulations and guidance to set the CoLC Standard						
	Cooling							
GO BACK	Chillers Performance Threshold	Building Regulations: Approved Document L2 2021 Requirements (Non-Residential): Cooling unit SEER:- Water-to-water chillers <400kW = 5.0 Water-to-water chillers 400–1500kW = 6.0 Water-to-water chillers ≥1500kW = 6.5 Vapour compression cycle chillers, air-cooled <400kW = 4.0 Vapour compression cycle chillers, air-cooled ≥400kW = 4.5	Building Regulations Conservation of fuel and power: Approved Document Part L1 [GN.1] Building Regulations Conservation of fuel and power: Approved Document Part L2 [GN.2]	V	√ 、	× •	< J	V
	<b>Air-cooled Chillers</b> Performance Requirements	Apart from meeting Building Regulations: Approved Document L2 2021 Requirements, the unit should be able to provide cooling to 7°C at External temperatures of 2°C at 50% duty [C.2] and have the following system efficiency when operating in offices – Chiller SEER : >=5.5 [C.3]	For to comply with the Tier 2 (2021) EcoDesign SSCE comfort cooling limits. [C.5]	~	√ ·	•	~	
	Water-cooled Chillers Performance Requirements	Energy Technologies List [C.x]:         Products shall have a Seasonal Space Cooling Energy Efficiency (nS,C) or Seasonal Energy Performance Ratio (SEPR) that is greater than or equal to the following:         For water cooled comfort chillers that provide cooling only:         • Below <400kW capacity: 2320%	For to comply with the Tier 2 (2021) EcoDesign SSCE comfort cooling limits. [C.5]	V	✓ 、	· ·	• •	J
GOBACK	Cooling Tower Performance Threshold and Requirement	The minimum efficiency per ASHRAE Standard 90.1 for induced draft open cooling towers applied to comfort cooling is 8.68 m3/hr/kW @ 35/29.5/23.8. There are no efficiency requirements for non-comfort cooling applications.	BS EN 14705:2005 [C.36] This Standard specifies requirements, test methods and acceptance tests for thermal performances pumping head verification of wet cooling towers and plume abatement for wet/dry cooling towers. – manufactured cooling towers should conform to this. CTI Certification (eurovent REC 9-12) [C.37] Certification means that the cooling tower has been tested under operating conditions and found to perform as rated by the manufacturer under those circumstances. It assures the buyer that the tower is not intentionally or inadvertently undersized by the manufacturer. The range of the certified thermal operating conditions shall not extend beyond the certified characteristics as per CTI STD-201, these being: Entering wet bulb temperature: 10°C to 32.2°C (50°F to 90°F) Cooling range > 2.2°C (4°F) Cooling approach > 2.8°C (5°F) Process fluid temperature < 51.7°C (125°F) Barometric pressure: - 91.4 to 105.0 kPa (27" to 31" Hg) Minimum thermal energy efficiency targets for open wet cooling towers are defined for the temperatures as per CTI Certification.		•		J	J

### **TECHNOLOGY GUIDE - PERFORMANCE STANDARDS**

36				New build	Refurb	Listed	Residential Commercial	Public (e.g. Schools)
	Requirements	Performance Requirements	Measurement Standards / Test Conditions	As	set Typ	e	Building	туре
	Category / Sub-category	Performance standards and specifications from industry standards, regulations and guidance to set the CoLC Standard						
GO BACK	DX Split Systems Performance Threshold and Requirement	Performance Threshold: Building Regulations: Approved Document L2 2021 Requirements (Non-Residential): Cooling unit SEER:- Packaged air conditioners SEER ≥ 3.0 Split and multi-split air conditioners SEER ≥ 5.0 For domestic applications, the minimum seasonal energy efficiency ratio of an air conditioner working in cooling mode should be SEER≥ 4.0 As per Part L, systems using heat recovery and capable of heating and cooling shall use the SEER for specific application. Performance Requirements: Products shall have a Seasonal Primary Energy Ratio (SPER) that is greater than or equal to the following: Greater than 1.72 for cooling (1.3 for heating). Where the seasonal primary energy ration (nS,C) is defined as the ratio between the reference annual cooling or heating demand pertaining to the cooling or heating season for a product and the annual energy consumption for cooling, corrected by contributions accounting for temperature control and the electricity consumption of ambient temperatures, wher applicable. System efficiency measures for Offices – Chiller SEER : >=5.5	ETL [BMS.1]: Units selected to have a Conformity Assessment mark. A Conformity Assessment mark is a new UK regulatory regime has now come into force in 31st December 2020 for manufactured goods being placed on the GB market and previously covered by the EU's CE marking (and similar markings). For to comply with the Tier 2 (2021) EcoDesign SSCE comfort cooling limits. Provide energy labels to products under 12 kW to allow customer to view and compare energy efficiency data between similar products [C.38]	J	~		V	~
	VRF System Performance Threshold	Building Regulations: Approved Document L2 2021 Requirements (Non-Residential): Cooling unit SEER:- • Variable refrigerant flow/volume (VRF/VRV) systems SEER ≥ 5.0 • For domestic applications, the minimum seasonal energy efficiency ratio of an air conditioner working in cooling mode should be SEER≥ 4.0 For VRF Systems, the SEER is for the full system including indoor units, outdoor units and power input for control. As per Part L, systems using heat recovery and capable of heating and cooling shall use the SEER for specific application.	Building Regulations Conservation of fuel and power: Approved Document Part L1 [GN.1] Building Regulations Conservation of fuel and power: Approved Document Part L2 [GN.2]	V	~		~ ~	~
	VRF Systems Performance Requirements	Products shall have a Seasonal Primary Energy Ratio (SPER) that is greater than or equal to the following: Greater than 1.72 for cooling (1.3 for heating) Where the seasonal primary energy ration (nS,C) is defined as the ratio between the reference annual cooling or heating demand pertaining to the cooling or heating season for a product and the annual energy consumption for cooling, corrected by contributions accounting for temperature control and the electricity consumption of ambient temperatures, wher applicable. System efficiency measures for Offices – Chiller SEER : >=5.5	ETL [BMS.1]: Units selected to have a Conformity Assessment mark. A Conformity Assessment mark is a new UK regulatory regime has now come into force in 31st December 2020 for manufactured goods being placed on the GB market and previously covered by the EU's CE marking (and similar markings). For to comply with the Tier 2 (2021) EcoDesign SSCE comfort cooling limits. Provide energy labels to products under 12 kW to allow customer to view and compare energy efficiency data between similar products [C.38]	V	√	•	• √	~
GO BACK	Hybrid VRF Systems Performance Requirements	Products shall have a Seasonal Primary Energy Ratio (SPER) that is greater than or equal to the following: Greater than 1.72 for cooling (1.3 for heating) Where the seasonal primary energy ration (nS,C) is defined as the ratio between the reference annual cooling or heating demand pertaining to the cooling or heating season for a product and the annual energy consumption for cooling, corrected by contributions accounting for temperature control and the electricity consumption of ambient temperatures, wher applicable. System efficiency measures for Offices – Chiller SEER : >=5.5	ETL [BMS.1]: Units selected to have a Conformity Assessment mark. A Conformity Assessment mark is a new UK regulatory regime has now come into force in 31st December 2020 for manufactured goods being placed on the GB market and previously covered by the EU's CE marking (and esimilar markings). For to comply with the Tier 2 (2021) EcoDesign SSCE comfort cooling limits. Provide energy labels to products under 12 kW to allow customer to view and compare energy efficiency data between similar products [C.38]	~	√	•	√ √	✓

124



Page

\$ 437

	New build	Refurb	Listed	Residential	Com merci al	Public (e.g. Schools)	City of London Documents and Guidance	Location and Decription	Project Management	Mechanical Engineer	Electrical Engineer	Architect	Public Health Engineer	Fire Engineer	Contractor	Building FM / End User
	As	set Ty	/pe	Buil	ding 1	ype	City	r of London Document Interlinks (TBC)			Key	Stak	ehold	ers		
							Task Bar	PPG Activities								
providing electric trace heating, next capacity, density, and t can rapidly corrode the air- leak detection (one credit) [C.4]. Credits for Pol 01] [C.16] D kgC02a/kW and 1 credit due to a obtained 20 emissions. be below 42dB. Consult MCS 020	J	V			~		Corporation Housing Design Guide Dec 2020 2) CoLC Climate	1) The checklist in the GLA's Energy Assessment Guidance is intended to assist designers to identify optimial overheating risk in redicating proteinal overheating risk in the second second should be used at concept stage and should triger the incorporation of passive measure within the building envelope and service design to mitigate overheating and reduce cooling demand in line with London Plan. 2007, the systems Shall maximise the use of renewable, aim for BREEAM Excellent Rating.		~	~	~			~	~
ELC) of s100 kgC02e/kW and 1 ak detection (one credit) [C.4]. Credits for PA-013 [C.16] e obtained 20 emissions. commondated, provided that a the heat. The use of Water to t.	v	A	V		4	~	ColC Climate Action Strategy 2020-2027	In line with the CoLC Climate Action Strategy 2020- 2027, the system shall maximise the use of renewable, aim for BREEAM Excellent Rating.		5	\$	•			~	~
coreia (CS) of the system has the cognonic blockin, the cause or evaporative condensor are Guidance L8(C.29) and CBSE volume of water used during volume of water used during water Efficient Equipment) for vestigate where water saving	J	•			~	J	Corporation Housing Design Guide Dec 2020 2) CoLC Climate	1) The checklish in the GIA's Dergy Assessment Goldance is intered to assist designers to identify potential overheating risk in residential accommodation early on in the design process. It should be used at concept stage and should trigget the incorporation of passive measures within the be used at a concept stage and should trigget potential and reduce cooling demand in line with London Plan. 2010 line with the CoLC Climate Action Strategy 2020- 2027, the systems shall maximise the use of renewable, aim for BREEAM Excellent Ruting.		J	~	~	~		1	~

### **TECHNOLOGY GUIDE - TECHNOLOGY STANDARDS**



	New build	Refurb	Listed	R esi den tial	Com merci al	Public (e.g. Schools)	City of London Documents and Guidance	Location and Description	Project Management	Mechanical Engineer	Electrical Engineer	Architect	Public Health Engineer	Fire Engineer	Contractor	Building FM / End User
	As	set Ty	/pe	Buil	ding T	ype		y of London Document Interlinks (TBC)			Keγ	/ Stak	ehold	ers		
providing electric trace heating, heat capacity, density, and c can rapidly corrode the air- kL(c) of 5100 kgC02e/kW and 1 leak detection (one credit). An Credits for PeI-01] we obtained to zemissions. at pumpers that be below 4208. Integrat that be below 4208. Integrat that see the second to the mand for refrigerant.	4	J	~		~	~		PPG-Activities 3) The shockils in the GAS Energy Assessment Guidance is intended to axis id segment to identify accommodation early on in the design process. It should be used at concept stage and should 'trigger the incorporation of passive measures within the building enviolege and envices design to migrate overheating and reduce cooling demand in line with todone Plan. 2) In line with the GAL Climate Action Strategy 2020- 2027, the systems all maximise the use of renewable, aim for BREEAM Excellent Rating.		~	\$				<ul> <li>A</li> </ul>	~
providing electric trace heating, heat capacity, density, and can rapidly correct the air- effect of s100 kgC02e/kW and 1 leak detection (one credit). An Credits for Pd-01] corrects for Pd-01] corrects for end to be below 4258. Credits for end to be below 4258. Striftgerant than the below 4258. Striftgerant than the below 4258. Striftgerant than the sequivalent WF emand for refrigerant	4	4	J		3	5	<ol> <li>City of London Corporation Housing Design Guide Dec 2020</li> <li>CoLC Climate Action Strategy 2020-2027</li> </ol>	1) The checklist in the GLA's Energy Assessment Guidance is intended to assist designers to identify potential overhealing risk in residential accommodation early on in the design process. It also also also also also also also also		2	3				~	~
providing electric trace heating, heat capacity, density, and at can rapid your offer the air- effect of the air- leak detection (one credit). An Credit for Pel-01] we obtained 020 emissions are pumpirs must be below 4288. "riggerant than its equivalent VBF minued for refriggerant consent.	4	J	4	~	~	~	<ol> <li>City of Landon Corporation Housing Design Guide Dec 2020</li> <li>Cola Climate Action Strategy 2020-2027</li> </ol>	1) The checklist in the GLA's Energy Assessment Guidance is intended to assist designers to identify optimital overhealing risk in residential and the state of the state of the state of the should be used at concept stage and should trigger the incorporation of passive measure within the building envelope and services design to mitigate overheating and reduce cooling demand in line with London Plan. 2007, the systems shall maximise the use of renewable, aim for BREEAM Excellent Rating.		~	~	•		~	~	~

### VENTILATION

#### **Overview**

Ventilation is the drawing of outside air into a building (supply) and / or the ejection of inside air to the outside (extract).

A well-designed ventilation system can help a building:

- Maintain a comfortable temperature
- Expel airborne impurities and odours
- Purify the air intake to remove outside pollutants
- Reduce moisture build-up and mould growth, leading to higher occupant wellbeing and satisfaction

The two main types of ventilation are:

• **Natural Ventilation:** Natural forces drive air through building openings, such as, windows, doors, chimneys and wind towers etc. Natural ventilation rates depend on climate, building design and activity. Natural ventilation has the benefit of not requiring an energy input, however, there is no consistency or certainty in the ventilation rates at a given time.  Mechanical Ventilation: Mechanical ventilation systems circulate fresh air using ducts and fans. Mechanical ventilation requires energy to drive the system, however, can lead to greater control of ventilation in a well-insulated building. Mechanical ventilation is also necessary when additional air is required to ventilate a space, for example sufficient fresh air in offices, or when air needs to be removed from a space, such as in toilets, which would not adequately be achieved by natural ventilation.

This category also includes humidification and dehumidification systems which are usually integrated within the ventilation system which regulates moisture content of air.

#### Interdependencies

The ventilation system often needs to work in conjunction with the other building services – with heating and or cooling and where needed (de)humidification delivered through the ventilation plant to maintain building comfort and environmental condition. Ventilation systems are therefore aligned closely with building controls such as the Building Management system (BMS). Improving lighting will decrease the internal gains of a building, increasing the heating load which may impact ventilation requirements.

There is a relationship between building airtightness, ventilation requirements and building fabric. New constructions should be built with high levels good fabric performance and airtightness to minimise heat loss. As a result, mechanical ventilation will be required which should be specified with heat recovery. Page

440

Well-designed thermal envelopes reduce localised surface condensation and interstitial condensation (a type of condensation that may occur within an enclosed wall, roof or floor cavity structure, which can create dampening).

#### **Air Handling/ Mechanical Ventilation**

An Air-Handling Unit (AHU) is used to circulate and recondition air as part of a ventilation, heating and/or cooling system. AHU takes in fresh air from outside and conditions it through filtration, heating, and cooling and then this air is distributed into the building. Heat can be recovered from returning to air which can reduce energy consumption, cost and carbon emissions. AHUs are available in a range of sizes, with various capabilities, but typically comprise an insulated box housing; filter racks or chambers, a fan (or blower), and sometimes heating elements, cooling elements, sound attenuators and dampers.

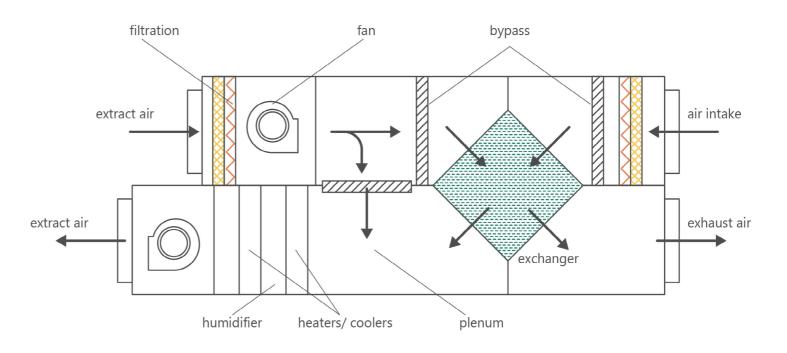


Figure 25 Example schematic of Air Handling Unit

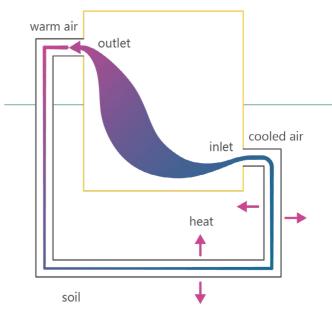
Mechanical Extract Ventilation refers to both centralised and de-centralised extract systems. These systems provide ventilation using a multipoint extract or single fan. Mechanical Extract Ventilation help protect buildings from mould, damp and condensation; hence they are often found in kitchens, WCs and shower rooms.

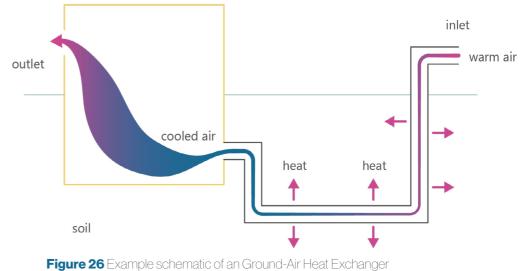
#### **Heat Recovery**

The main objective of a heat exchanger is the recover the energy that would otherwise be ejected by an extract ventilation system. A heat recovery unit comprises a directly driven fan, an exhauster and a heat exchanger.

#### **Ground Air Heat Exchanger**

Ground-air heat exchangers (also known as 'earth tubes') offer an innovative method of heating and cooling a building and are often used on zero carbon / PassivHaus buildings. Incoming ventilation air is simply drawn through 1.5 m deep underground pipes which pre-heats the air in the winter and precools the air in the summer.





#### Dehumidification

High humidity promotes fungal growth and increases the release of volatile organic compounds. This can lead to respiratory illnesses, mental distress and damage to the building. The ideal relative humidity is 40-70%, although it is recommended to be below 60% in domestic dwellings, or any building fitted with mechanical air conditioning. CoLC has museums and galleries where the stability of the internal environment is a vital and basic factor in the preservation of art and objects, requiring temperature and humidity to be strictly controlled. Museums and galleries need to actively control the environment around exhibits, as temperature and relative humidity can fluctuate significantly daily. This requires constant operation of the humidification system, which therefore needs to be reliable and responsive.

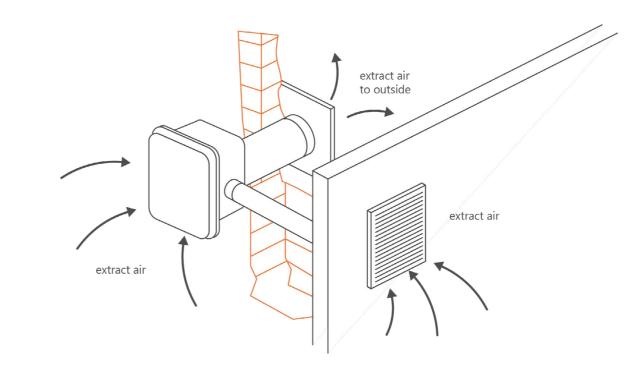


Figure 27 Example schematic of Localised Extract Fan

Page 443

Humidity can be controlled by limiting sources of moisture, increasing ventilation, or removing moisture through dehumidification. Electrically powered dehumidification units, running on a closed cycle, draw air from a given space, heat and dry it, and then return it to the same space. The moisture from the air can be collected and taken to drain where necessary.

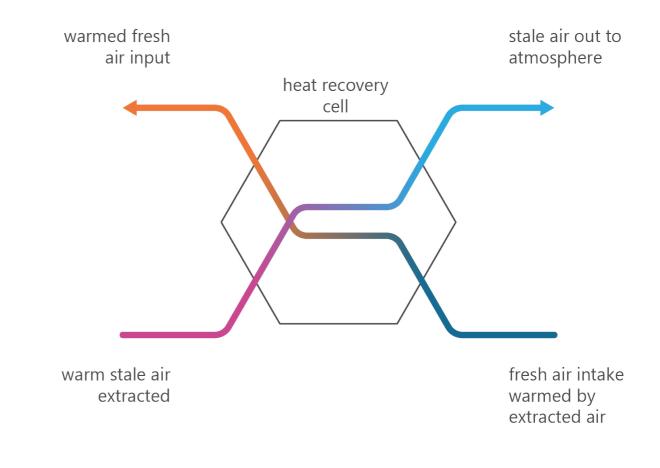


Figure 28 Example schematic heat recovery

### **TECHNOLOGY GUIDE - PERFORMANCE STANDARDS**

			New b Refu	Liste	
equirements	Performance Requirements	Measurement Standards / Test Conditions	Asset 1	уре	1
ategory / Sub-category	Performance standards and specifications from industry standards, regulations and guidance to set the CoLC Standard				
ntilation					
	<ul> <li>Central balanced mechanical ventilation system with heating and cooling: Maximum SFP = 1.6 W/(l.s) for new buildings.</li> <li>Central balanced mechanical ventilation system with heating and cooling: Maximum SFP = 2.2 W/(l.s) for existing buildings.</li> <li>Central balanced mechanical ventilation system with heating only: Maximum SFP = 1.5 W/(l.s) for new buildings.</li> </ul>	Specific fan power is a function of the system resistance that the fan has to overcome to provide the required flow rate. BS EN 13779 Table A8 provides guidance on system pressure drop. [V1]			
	Central balanced mechanical ventilation system with heating only: Maximum SFP = 1.8 W/(I.s) for existing buildings	Specific fan power is a function of the system resistance that the fan has to overcome to provide the required flow rate. BS EN 13779 Table A8 provides guidance on system pressure drop [CP4]			
	Extending SFP for additional components: •Additional return filter for heat recovery: +0.1 W/(l.s) •HEPA Filter: +1.0 W/(l.s)				
	•Heat Recovery – themal wheel system: +0.3 W/(l.s) •Heat Recover – other systems: +0.3 W/(l.s)				
	•Humidifier / Dehumidifier: +0.1 W/(I.s)				
	Specific fan powers (SFP) in air distribution systems in new buildings (existing buildings are provided in brackets) should be no more than: •Central balanced mechanical ventilation system with heating and cooling 2.0 (2.6)		✓ •	•	
	•Central balanced mechanical ventilation system with heating only 1.9 (2.2) •All other central balanced mechanical ventilation systems 1.5 (2.0)				
	•Zonal supply system where fan is remote from zone, such as ceiling void or roof-mounted units 1.1 (1.4) •Zonal extract system where fan is remote from zone 0.5 (0.5)				
	<ul> <li>Zonal balanced supply and extract ventilation units, such as ceiling void or roof units 2.3 (2.3)</li> <li>Local balanced supply and extract ventilation system, such as wall/ roof units 2.0 (2.0)</li> <li>Local supply or extract ventilation units, such as window/wall/roof units (e.g. toilet extract) 0.3 (0.4)</li> </ul>				
	•Other local ventilation units 0.5 (0.5) •Fan assisted terminal variable air volume (VAV) unit 0.5 (0.5)				
	•Fan coil unit (rating weighted average) 0.4 (0.4) •Kitchen extract, fan remote from zone with grease filter 1.0 (1.0)				
ract only ventilation formance Threshold and Requirement	Specific fan powers (SFP) in air distribution systems in new buildings (existing buildings are provided in brackets) should be no more than:	Specific fan power is a function of the system resistance that the fan has to overcome to provide the required flow rate. BS EN 13779 Table A8 provides guidance on system pressure drop. [CP4]			
	•Zonal extract system where fan is remote from zone 0.5 (0.5) •Local supply or extract ventilation units, such as window/wall/roof units (e.g. toilet extract) 0.3 (0.4)	Ab provides Baldance on system pressure drop. [cl 4]			
	•Other local ventilation supply or extract units 0.5 (0.5) •Kitchen extract, fan remote from zone with grease filter 1.0 (1.0)		√ √		
	The maximum SFP may be increased where any of the following components are included in the installation: •High-efficiency particulate air (HEPA) filter +1.0				
	•Humidifier/dehumidifier +0.1 •Active chilled beams +0.3				
	•Transpired solar collector +0.3				
eat recovery rformance Threshold and Requirements	<ul> <li>Ventilation systems that provide supply and extract ventilation should be fitted with a heat recovery system where technically feasible.</li> <li>Specific fan power for zonal supply and extract ventilation units with heat recovery should be 1.9 W/(I-s) for new buildings and existing buildings</li> </ul>	<ul> <li>BS EN 15232:2012 Ventilation for buildings. Air handling units. Rating and performance for units, components, and section [V2]</li> <li>BS EN 13053:2006+A1:2011 Application of a heat recovery system [HR.9]</li> <li>BS EN 308:1997 Heat exchangers. Test procedures for establishing the performance of air-to-air flue gases heat recovery devices [HR.8]</li> </ul>			
	•Specific fan power for zonal supply and extract ventilation units with heat recovery should be 1.6 W/(I-s) for new buildings and existing buildings				
	The Building Regulations Part L Non-Domestic Compliance Guide provides the following minimum dry heat recovery efficiencies for the following systems: • Plate heat exchanger: 50% • Heat pipes: 60%		√ √	•	
	• Thermal wheel = 65% • Run around coil = 45%				
	Part L1 of The Building Regulations states that all ventilation systems which provide both supply and extract within the same unit should have a heat recovery system with a minimum				
ound Sourced Air Heat Exchanger Performance reshold and Requirements	efficiency of 73% Performance of a ground-air heat exchanger is a function of the following: • air flow rate	NA			İ
	temperature of the outside air     temperature of the inside		• •	•	
	• temperature of the ground As these are external factor, COP standards are not provided in building regulations, as of yet.				
humidification Performance Threshold and quirements	The ideal relative humidity is 40-70%, although it is recommended that it should be below 60% in homes or in any building where it can be controlled by mechanical air conditioning [DEH.2].	CIBSE TM 40 [DEH.1] Testing of performance should be against BS EN 810:1997 [DEH.3]			I
	Reporting of performance shall be in line with BS EN 810:1997. The output shall be based on requirements of building activity and size. Levels of humidity depends on building usage an moisture production.	d			
	Approved Document F1 produces the required maximum indoor air relative humidity for new residential, for the following moving average period: • 1 month = 65%		√ •	•	
	1 week = 75% • 1 day = 85%				
	For commercial developments, the dehumidification requirements will depend on building/room activity.				

### **TECHNOLOGY GUIDE - TECHNOLOGY STANDARDS**

	Requirements	Technical standards - For references, please refer to the 'Appendix' tab			
	Category / Sub-category	Further guidance on design considerations and how the technology category or sub-category should be installed to deliver the performance standard targets			
	Ventilation	Key Design and Operation	n Considerations	Compatibility / Future proofing	Environmental Impact
	Air Handling/ Mechanical Ventilation Performance	An AU generally register filters to help confident that are prior to the air being supplied to the index spaces. The type of filters include: INFAR filters are increased and the prior betters and on a common wherease from the air. INFAR filters are related and the prior betters and on a common wherease from the air. INFAR filters are related and the prior betters and on a common wherease from the air. INFAR filters are related and the prior betters and on a common section of the common section of the prior better and the prior better and the prior better and the prior better and the prior better and the prior better and the prior better and the prior better and the prior better and the prior better and the prior better and the prior better and the prior better and the prior better and the prior better and the prior better and the prior better and the prior better and the prior better and the prior better and the prior better and the prior better and the prior better and the prior better and the prior better and the prior better and the prior better and the prior better and the prior better and the prior better and the prior better and the prior better and the prior better and the prior better and the prior better and the prior better and the prior better and the prior better and the prior better and the prior better and the prior better and the prior better and the prior better and the prior better and the prior better and the prior better and the prior better and the prior better and the prior better and the prior better and the prior better and the prior better and the prior better and the prior better and the prior better and the prior better and the prior better and the prior better and the prior better and the prior better and the prior better and the prior better and the prior better and the prior better and the prior better and the prior better and the prior better and the prior better and the prior better and the prior better and the prior better and the prior better and the prior better and the pri		Idealing and cooling can be generated within the AHU Itself, or it can be provided by connecting to the building's space heating system and children.     Idealing and cooling to be used in conjunction with AHUs, allowing heat and cooling to be produced using highly efficient systems, reducing the overall energy impact of the building.	10 smalless sufficient index / to Calify (MG), this first draign consideration should be to gates vertice provides and the implementation of the implementation of the implementation of the implementation of the implementation of the implementation of the implementation of the implementation of the implementation of the implementation of the implementation of the implementation of the implementation of the implementation of the implementation of the implementation of the implementation of the implementation of the implementation of the implementation of the implementation of the implementation of the implementation of the implementation of the implementation of the implementation of the implementation of the implementation of the implementation of the implementation of the implementation of the implementation of the implementation of the implementation of the implementation of the implementation of the implementation of the implementation of the implementation of the implementation of the implementation of the implementation of the implementation of the implementation of the implementation of the implementation of the implementation of the implementation of the implementation of the implementation of the implementation of the implementation of the implementation of the implementation of the implementation of the implementation of the implementation of the implementation of the implementation of the implementation of the implementation of the implementation of the implementation of the implementation of the implementation of the implementation of the implementation of the implementation of the implementation of the implementation of the implementation of the implementation of the implementation of the implementation of the implementation of the implementation of the implementation of the implementation of the implementation of the implementation of the implementation of the implementation of the implementation of the implementation of the implementation of the implementation of the implementation of the implem
GO BACK	Extract only fans	Beakle ductions/s should meet the standards of 858/43 g8 c43/0131 [IGF 3] When enhauts at its ducted and discharged at a single point, its associate for accover heat with a run-around coil [EGF.1] • For external fans, consult electrical engineer for the required ingress protection rating [IP] based on the fans located and weather exposure. • Where unban traffic is a source of pollution, the ventilation intakes should be as high as possible or on the less polluted side of the building.	sessment thould be conducted to highlight any problems. Part F of the Building Regulations provides guidance on avoiding back-draught in extract systems (IDI-6), and any session and the backer of Remark (IDI-5). Residential Considential in Considential in Regulations provides minimum entract rates (I/s) for residential rooms for both intermittent extract Schlarbe (IDI-6) and anticed the system (IDI-6). Schlarbe (IDI-6) and anticed the IDI-6). Schlarbe (IDI-6) and anticed the IDI-6). Schlarbe (IDI-6) (IDI-6). Schlarbe (IDI-6) (IDI-6). Schlarbe (IDI-6). Schlarbe (IDI-6). Schlarbe (IDI-6). Schlarbe (IDI-6). Schlarbe (IDI-6). Schlarbe (IDI-6). Schlarbe (IDI-6). Schlarbe (IDI-6). Schlarbe (IDI-6). Schlarbe (IDI-6). Schlarbe (IDI-6). Schlarbe (IDI-6). Schlarbe (IDI-6). Schlarbe (IDI-6). Schlarbe (IDI-6). Schlarbe (IDI-6). Schlarbe (IDI-6). Schlarbe (IDI-6). Schlarbe (IDI-6). Schlarbe (IDI-6). Schlarbe (IDI-6). Schlarbe (IDI-6). Schlarbe (IDI-6). Schlarbe (IDI-6). Schlarbe (IDI-6). Schlarbe (IDI-6). Schlarbe (IDI-6). Schlarbe (IDI-6). Schlarbe (IDI-6). Schlarbe (IDI-6). Schlarbe (IDI-6). Schlarbe (IDI-6). Schlarbe (IDI-6). Schlarbe (IDI-6). Schlarbe (IDI-6). Schlarbe (IDI-6). Schlarbe (IDI-6). Schlarbe (IDI-6). Schlarbe (IDI-6). Schlarbe (IDI-6). Schlarbe (IDI-6). Schlarbe (IDI-6). Schlarbe (IDI-6). Schlarbe (IDI-6). Schlarbe (IDI-6). Schlarbe (IDI-6). Schlarbe (IDI-6). Schlarbe (IDI-6). Schlarbe (IDI-6). Schlarbe (IDI-6). Schlarbe (IDI-6). Schlarbe (IDI-6). Schlarbe (IDI-6). Schlarbe (IDI-6). Schlarbe (IDI-6). Schlarbe (IDI-6). Schlarbe (IDI-6). Schlarbe (IDI-6). Schlarbe (IDI-6). Schlarbe (IDI-6). Schlarbe (IDI-6). Schlarbe (IDI-6). Schlarbe (IDI-6). Schlarbe (IDI-6). Schlarbe (IDI-6). Schlarbe (IDI-6). Schlarbe (IDI-6). Schlarbe (IDI-6). Schlarbe (IDI-6). Schlarbe (IDI-6). Schlarbe (IDI-6). Schlarbe (IDI-6). Schlarbe (IDI-6). Schlarbe (IDI-6). Schlarbe (IDI-6). Schlarbe (IDI-6). Schlarbe (IDI-6). Schlarbe (IDI-6). Schlarbe (IDI-6)	Measures for flooding.	<ul> <li>Mechanical ventilation system, including both continuous and intermittent mechanical ventilation, she minime nois. The include-dois ong all of the following [EOF.4]:     </li> <li>Litarvist pit devigament i appropriately and securely fixed, such as using resilient mountings where n     building could be a problem.     </li> <li>Consult building requires it appropriately and securely fixed, such as using resilient mountings where n     building could be a problem.     </li> <li>Consult building requires the appropriately and securely fixed, such as using resilient mountings where n     building could be a problem.     </li> <li>Consult building requires the secure of fixed and the secure of fixed and the secure of the secure of the secure of the secure of the secure of the secure of the secure of the secure of the secure of the secure of the secure of the secure of the secure of the secure of the secure of the secure of the secure of the secure of the secure of the secure of the secure of the secure of the secure of the secure of the secure of the secure of the secure of the secure of the secure of the secure of the secure of the secure of the secure of the secure of the secure of the secure of the secure of the secure of the secure of the secure of the secure of the secure of the secure of the secure of the secure of the secure of the secure of the secure of the secure of the secure of the secure of the secure of the secure of the secure of the secure of the secure of the secure of the secure of the secure of the secure of the secure of the secure of the secure of the secure of the secure of the secure of the secure of the secure of the secure of the secure of the secure of the secure of the secure of the secure of the secure of the secure of the secure of the secure of the secure of the secure of the secure of the secure of the secure of the secure of the secure of the secure of the secure of the secure of the secure of the secure of the secure of the secure of the secure of the s</li></ul>
	Heat recovery	balance between the supply and acttact flows. • Consult the manufacture for spatial regiments around the MVIR to allow for routine maintenance, without excessive disruption to the system's operation. • Filters should be accessible introduces system pressure. Fieldble ducts should be used only for connections to MVIR units and diffusers. • User rigid ducts where feasible to reduce system pressure. Fieldble ducts should be used only for connections to MVIR units and diffusers. • Minimise bends in the ductwork duspits to prevent pressure build up during the circulation routing. • A thermal bysas hand be decigned to perform when bate recovery in not abvantageness, such as in summertime. • A Thermal when instrin can be epsicy coated aluminium or hydroscopic material to remove moisture from the alistream - this would reduce the amount of humification needed to dry incoming witter ar.	the total of the fresh air and supply duct side of the system and also on the extext and exhaust air side of the system (HR.1). A sair premability of Sain(2h) at 50 by provided as a nation in Approved Document F for the use of an MMHR system (HR.2). For optimum performance, this should be below 3a/m2,0h at 50 Pa (HR.3). - 16:04 = 150 Pa - 16:47 = 200 Pa - 18:49 = 200 Pa - 18:49 = 200 Pa - 18:49 = 200 Pa	- Overheating control so that when hear recovery is not needed the heat exchanger's stopped modulated or hypaxed Building should be draigned us that they can be commissioned to suitable ventilation rates so that spaces are not significantly overventilated	• A property specified and installed MVMB system will recover heat to an efficiency level of more than 50 electricity comuniposition level of anoul 2014/m31 (Pk.2)]. High grade littlers should be specified in the system. All interval more specified and 64 electronic baseling regulations per to fit crises regarding sound proofing (HR.7)]. Passishaus provides specifications, this covers (PR.6): ~ -0.568A in the installation or plant crise.
	Ground-Air heat exchanger	<ul> <li>A ground heat exchanger can be buriet horizontally in a tench or vertically in a borehole; it will depend on area available, projections and cast. Vertical arrangements are more castly and require aspecializationstatic or its institutions. However, they are utilable in applications where that is limited.</li> <li>The optimum pipe heigh is a function of pipe diameter and air velocity. Small pipe diameters of between 200 and 300mm are thermally more efficient. Pipes should be buried at a minimum dight of 2 man argumated by 3.2 m to allow beard dispatch more thermally more efficient. Pipes should be buried at a minimum dight of 2 man argumated by 3.2 m to allow that dispatch more than a provide bary (bargumater).</li> <li>If the earth ube diameter is parted than 1.2 m, consider adding interior devices such as vanes and talkets to encourage air hubulence, thereby increasing heat thank to dispatch that and barder. La consider adding interior devices such as vanes and talkets to encourage air hubulence, thereby increasing heat thank to dispatch that and the constraint barde to allow the stratem and the avail strates (2044; 2).</li> <li>If the earth ube diameter is parted to a strate air/low. Cruce type of pipe, fitting, ebows, pressure losses and building load requirements are known, air velocities can be calculated using fam laws (GAHE 2).</li> <li>Consideration: A ground survey should be conducted to ensure adequate spacing is available and any obstructions to laying the pipework have been identified.</li> </ul>	ii Soll moisture iii Soll compaction • Operation of GAHE can be continuous, on a schedule, load dependant, seasonal, or a combination. This operation must be carefully considered as the	<ul> <li>system can be driven by statural stack ventilation, but usually require mechanical ventilation.</li> <li>Ar can be circulated us all handling usually adventilation stature (colored, as all specification) and an observation of the source of the montary initial and outlet temperatures, as well as indoor air temperatures (GAHE-1).</li> <li>This system can be used in conjunction with other HVAC systems and should not be solely relied upon to provide all heating and cooling loads of a building.</li> </ul>	To ensure a fast removal of the condensate, a continuous gradient of approximately -3.2 % is necessary take. The draining of the condensate can be done via a condensate collector shuft lying outside the build installed in the building (GAHE.3).
GO BACK	De-humidification	In on intrusity evidence condensation, the duration and amount of heating should be regulated in maintails the internal surface temperatures above deependent. In instrusity evidence building, buckground ventilation should be provided to alitize-scale heat of policy and the support of the subscription of the support of the subscription of the support of the subscription of the support of the subscription of the support of the subscription of the support of the subscription of the support of the support of the support of the subscription of the support of the support of the support of the support of the support of the support of the support of the support of the support of the support of the support of the support of the support of the support of the support of the support of the support of the support of the support of the support of the support of the support of the support of the support of the support of the support of the support of the support of the support of the support of the support of the support of the support of the support of the support of the support of the support of the support of the support of the support of the support of the support of the support of the support of the support of the support of the support of the support of the support of the support of the support of the support of the support of the support of the support of the support of the support of the support of the support of the support of the support of the support of the support of the support of the support of the support of the support of the support of the support of the support of the support of the support of the support of the support of the support of the support of the support of the support of the support of the support of the support of the support of the support of the support of the support of the support of the support of the support of the support of the support of the support of the support of the support of the support of the support of the support of the support of the support of the support of the support o	<ul> <li>The dot relative humlely 14 2-70%, shhody it is resommended that it should be below 60% in homes or in any building where it can be controlled by mechanical access molatore in reconstruction (BML).</li> <li>Once exess molatore is removed from the construction plane, the rate at which humlely increase is determined by building attributes and the construction plane, the rate at which humlely increase is determined by building attributes and the construction plane, the rate at which humlely increase is determined by building attributes and the construction plane, the rate at which humlely increase is determined by building attributes and the construction building attributes and the construction being attributes in the analytic attributes and the construction being attributes in the more plane. The should be determined what system(b) were in place to prevent condentation in the original building. These should then be retained and improved, if necessary (DEK1).</li> </ul>	Residential Consideration: Dehumidification units are not appropriate for domestic buildings when used as a long term solution to moisture	• Excesses and sustained levels of modulur within a building can lead to the growth of modul. Moduly exceence regularizing starges and can also can emerid alterns and alterns at many table building the module growth on internal surfaces and assess moisture control inline with BS 5250-2021 [DEA1].

	New build	Refurb Set Th	Listed	Residential	Com mercial	Public (e.g. Schools)	City of London Documents and Guidance	of London Document Interfinity (TBC)	Project Management	Mechanical Engineer	Electrical Engineer	Architect	Public Health Engineer	Fire Engineer	Contractor	Building FM / End User
	AS	iser 1	ype	Bui	ung i	уре	Task Bar	PPG Activities			ĸey	Stake	enoiu	613		
In initiales away from sources of this can load to higher energy of ar assessing MQ and disease to demonstrate that a imitted. The credit oriteria require 2 Safety Executive publication, pproved Code of Practice and	~			1	s.	¢.				J	V	V			~	~
d be designed and installed to e carried by the structure of the al standards for residential	~	~	~	~	~	~				~	~	~			~	~
n the main unit, with a total the extract is recommended al standards for residential	~	~	s.	~	~	~	Corporation Housing Design Guide Dec 2020 2) Guildhall Specification and tender summary for the	ia) PGI: The choice of mechanical extract ventilation (MCV) or mechanical ventilation with heat recovery (MVH) should conside energy efficiency, air quality, maintenance burder, cost and embodied carbon. MVV systems are less suitable in areas of poor air quality due to the lack of filtration of external air. Ib) PBS: NHBC Foundation's Guide: Part F 2010 — where to start: an introduction for house builders and designers, INHBC Foundation, 2011) and CIBSE dide & 22 (CIBS, 2016). For MVH Re true lucks in NHBC		~	~	~			~	~
en installing the heat exchanger				•		•		Standards (Dapter E.3 of The Domestic Ventillation complance Guide (MES, 20.3) provides guidance on the installation, inspection, testing and commissioning of ventilation systems. 2a) P49: All fans and ancillary equipment to be mounted in accordance with manufacturer on purpose-metic functions, supplicit by the fan manufacturer. All supports and hangers for the EC to prevent vibrations or movements. All new snoke to prevent vibrations or movements. All new snoke to top to 10 a Donars and should be equipped with 400°C for up to 2 hours and should be equipped with and have a reinforce body and painted with prevent should have a reinforce body and painted with prevent should have a reinforce body and painted with		J		J			~	J
rits a health hazard, which can	A	4	~	4	4	4		have a modular motor-impelier assembly and the housing should be with motor access often of re easy connection. The impelier should be manufactured from cast aluminatium with picht angle. The motor shall be housed in a standard snychronous squrfer spatiation entries (SOCT): Mounters and the standard voltages: 230(4007 VOH: in three phase and 2 speed motors. IE3 efficiency motor from 0.75KW up to 45KW in single speed.		J	2	~	~		~	~

#### **Overview**

Electric power (measured in Watts) is the rate at which electrical energy is transferred by an electrical circuit.

Increasing energy efficiency and reducing energy demand is essential to lowering GHG emissions. Electrical power is generated by the conversion of a source of energy such as fossil fuel, nuclear, wind or solar power. This power is provided through grid connection to distribute energy to where it is required. By sourcing more energy from renewable sources, the grid can decarbonise.

#### Interdependencies

If lighting systems have been improved from fluorescent to LED lamps, there may be an increased heating load for the building as internal gains are reduced. On the other hand, this change in lighting can reduced cooling loads. Power Factor correction is related to the loads and equipment that is installed in the building and will determine how viable and successful this opportunity would be. Finally electric vehicles will impact on the potential power demand for the building alongside introduction of solar PV. Power Factor Correction Equipment.

#### **Power Factor Correction Equipment**

Power factor is the ratio of energy a device is capable of transmitting to the output versus the total amount of energy it takes from the input power source. Power factor correction is an approach that can be used to increase the power factor of a power supply. Power Factor is a unit-less number used in alternating current circuits. It can be used for many appliances, from a single piece of equipment (like a motor) to all the electrical consumption of a building. The number is determined by the ratio between true power and apparent power, shown by the formula Power Factor = kW/ kVA.

Having a power factor of one correlates to 100% of the electricity flowing through the distribution system being used. For a pure resistive load, the value of power factor is one. However, when the load becomes more inductive or capacitive, the power factor of the circuit decreases. Power Factor Correction technology can be applied at a load level or at a building main incoming supply level.

#### **Electric Vehicles**

All vehicles sold in the UK are required to be zero emission by 2040. This requires an increase in low emission vehicles such as Electric Vehicles (EV's) or hydrogen vehicles to be produced and sold. Hydrogen vehicles and charging infrastructure is still being developed, however electric vehicles and charging infrastructure have reached market maturity.

Vehicle charging is anticipated to take place at home, on the streets, and at destination sites. An EV charge point is required to charge electric vehicles. Charging points must be capable of providing a reasonable power output for each parking space. Charges within a commercial office building can be slower than sites such as retail destinations as the user is likely to be on-site for longer. At a retail destination the length of stay is likely to be shorter, and therefore a faster, more powerful charger is required. Each charger must be compatible with all vehicles which may require access to it and should comply with connection standards.

#### **Lighting and Controls**

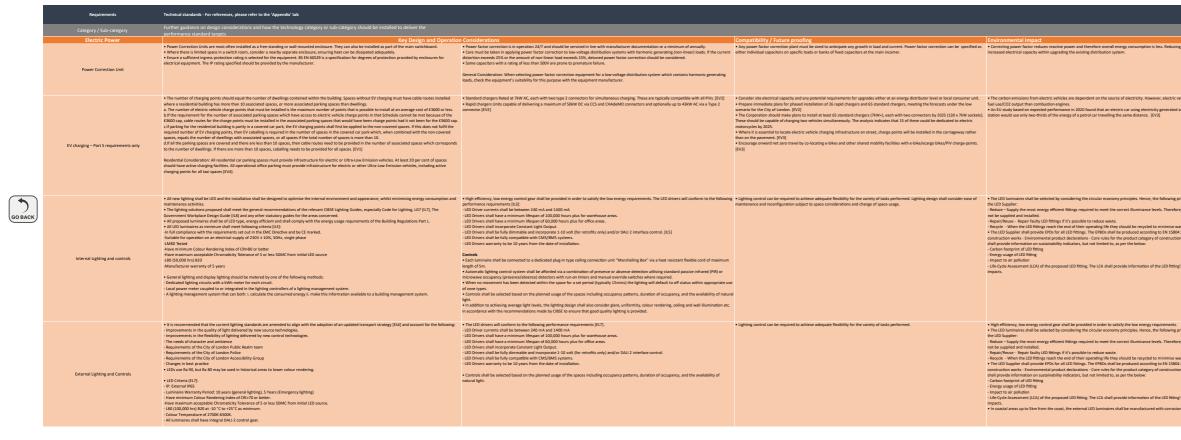
Energy efficiency plays an essential role in achieving net zero and installing light-emitting diode (LED) lighting is one of the quickest and simplest measures to reduce energy consumption. LED lighting provides a more accurate colour rendering, a uniform illuminance output, reduced maintenance requirements and a longer rated lumen output than older forms of lighting. LEDs and other lamp types can be controlled by a range of methods, of which the most efficient are automated controls linked to a management system that can 'dim out' based on external daylight levels and occupation of the lit zone.

### **TECHNOLOGY GUIDE - PERFORMANCE STANDARDS**

Performance Requirements Measurement Standards / Test Conditions auirements gory / Sub-category **Power Correction Unit** There is no performance standard specifically for the power factor technology and devices of facilities and equipment connected to the grid, however the objective of power factor BS EN 61439-1: Capacitors with a rating less than 500 V are prone to premature fa Performance Threshold and Requirement equipment is to move the performance as close to 1 as possible. Technology solutions should be assessed based on this criteria with the assumption that it will in or out to maintain the containing harmonics generating loads. [IL10] power factor better than a pre-set limit and should achieve a threshold of 0.95 BS EN 60831-1: Cover shunt power capacitors of the self-healing type for a.c. syste BS EN 60529: Specification for degrees of protection provided by enclosures for el Power Factor Correction IEE Wiring Matters (2006) [PF3] EV Charging All points will support a charging rate of 3.6kVA. Some should be able to support 7kVA and where appropriate 22kVA/3 phase. On larger installations consider providing very fast Building Regulations Approved Document Part S. [EV1] Threshold and Requir charging e.g. Mode 4/DC. BREEAM requirements: Provide electric recharging stations of a minimum of 3kW for at least 10% of the total car parking capacity for the development. Threshold Performance is set out in Building Regulations Part L 1 for Domestic Buildings Internal lighting and controls Performance Building Regulations Part L 1 for Domestic Buildings [IL1] New or existing residential, each internal light fitting should have lamps with a minimum luminous efficacy of 75 light source lumens per circuit-watt. Building Regulations Part L 2 for Non-Domestic Buildings [IL2] Threshold and Requirement Should have local controls to allow for the separate control of lighting in each space or zone. SLL Lighting Handbook: Provides lighting requirements, including lux levels, colour Where installed in a new or existing residential, fixed external lighting should have both of the following controls. requirements [IL3] a. Automatic controls which switch luminaires off in response to daylight. IES LM-80 Approved Method [IL4] b. If luminous efficacy is 75 light source lumens per circuit-watt or less, automatic controls which switch luminaires off after the area lit becomes unoccupied. If luminous efficacy is IEC 62386: DALI-2 Lighting control system requirements [IL5] greater than 75 light source lumens per circuit-watt, manual control is acceptable. The Ecodesign for Energy-Related Products and Energy Information (Lighting Prod Threshold Performance is set out in Building Regulations Part L 2 for Non-domestic Buildings a. If it is general lighting, either: i. have an average luminaire efficacy of 95 luminaire lumens per circuit-watt ii. the Lighting Energy Numeric Indicator (LENI) method, following Appendix B in the Approved Document. b. If it is display lighting, any of the following: i. have an average light source efficacy of 80 light source lumens per circuit-watt ii. have a rated power usage no greater than 0.3W/m2 in each space iii. the LENI method, following Appendix B. 5 c. For high excitation purity light sources, an average light source efficacy of 65 light source lumens per circuit-watt. Performance Specification for all Buildings SLL Lighting Handbook: Provides lighting requirements, including lux levels, colour Internal Lighting Colour: CCT 3500K-6500K requirements [IL3] Performance Requirements Efficacy: 160 lumens/watt IES LM-80 Approved Method [IL4] Design life: Office Areas: L80, B20 @ >= 50,000 hours , 25°C ambient. Warehouse/industrial Areas: L80, B20 @>= 50,000 hours, 25°C ambient IEC 62386: DALI-2 Lighting control system requirements [IL5] Power Factor: 0.9 min Flicker factor: < 15% The Ecodesign for Energy-Related Products and Energy Information (Lighting Prod Dimming range: 1-100% of measured output External lighting and controls Performance There is no specific performance threshold for this sub-category. Light and Darkness in the City - A lighting vision for the City of London: Recommer Performance Standard considering intensity, colour temperature, colour rendering, glare and scale. [EL3] Threshold and Requirement 140 lumens/Watt (Meet BREEAM International New Construction requirement No.2 of ENE 03 External Lighting) [EL1] BRE: BREEAM International New Construction: Requirement for 140 lumens/Watt Have minimum Colour Rendering Index of CRI>70 or better. [EL2] IES LM-80 Approved Method [EL4] Have maximum acceptable Chromaticity Tolerance of 5 or less SDMC from initial LED source.[EL3] TM-30-15: Colour rendering guide [EL2] L80 (100,000 hrs) B20 at -10 °C to +25 °C as minimum.[EL3] Housing Design Guide 2020: Lighting requirements for steps and ramps - 30lux, 0. Colour Temperature of 2700K-6500K. [EL3]

	New build	Refurb	Listed	Residential	Commercial	Public (e.g. Schools)
	As	set Ty	pe	Buil	ding T	⁻ уре
ailure when used with low-voltage distribution systems tems having a rated voltage up to and including 1000 V [PF1] electrical equipment. [PF2]	√	•	•		~	V
	√	•	•	~	~	√
ur rendering, colour temperature, glare and efficiency ducts) Regulations 2021 2021 No. 1095. [IL6]	V	V	•	V	V	~
ur rendering, colour temperature, glare and efficiency ducts) Regulations 2021 2021 No. 1095. [IL6]						
ended improvements to the City's light quality through ] It to meet the Ene 03 credit (60lm/watt). [EL1] 1.4 uniformity. [EL5]	V	$\checkmark$	•	~	~	V

### **TECHNOLOGY GUIDE - TECHNOLOGY STANDARDS**



	> New build	q. nja Beset T	Abe	Residential	Com merci al	Public (e.g. Schools)		of London Document Interfiniks (TBC)	Project Management	Mechanical Engineer	Electrical Engineer	Architect	pp Public Health Engineer	sa Fire Engineer	Contractor	Building FM / End User
g reactive power can also provide	J	V	J		V	J	NA	NA		~	~				4	~
vehicles are far more efficient in	V	V	~	~	V	~	NA	NA		~	V	V			~	~
principles shall be incorporated by re, an excess of LED fittings will aste. 4:2012+A2 "Sustainability of on products" [IUS]. The EPBDs g's lifetime environmental	V	V	1	~	√	√	1) CoLC Housing Design Guide 2020	4.2 Lighting Standards (48)		~	~	~			~	7
principles shall be incorporated by re, an ancess of LED fittings will asso. 42012-A2 "Sostainability of an product" (TLB). The EPBDs g's lifetime environmental on resistance materials.	~	V	J	J	J	J	Design Guide 2020 2) Light and Darkness in the	1) 6.18 Homes: Lighting 2) 4.1 Technology 4.2 Lighting Standards (48)		4	~	J			4	5

### CONTROLS

#### **Overview**

Control and monitoring of a buildings electrical equipment such as ventilation, lighting, energy, fire systems, and security systems can be archived through management platforms. This allows flexibility and remote control of a building's temperature and lighting, to tailor it to the use requirements of the building through programming to reflect occupant schedules. Metering can be used to monitor energy use and report on that consumption.

#### Interdependencies

Controls have interdependences across all the building services - heating, cooling, lighting and ventilation, to provide information on optimise performance and support decision.

#### **Building Management Systems (BMS)**

The Building Management System (BMS) or with additional functionality the Building and Energy Management System (BEMS) is defined as a network of graphical user interface and controllers, with the ability to exchange information with each component of the system to coordinate control. A BMS enables the remote management of Heating, Ventilation and Air conditioning (HVAC) and therefore controls the environmental conditions (temperature, ventilation rate and/or air quality) in individual zones (rooms or areas) within a building. A BMS can be programmed to maintain environmental conditions within pre-set limits in a manner that reflects occupation schedules, occupation status and/or level of activity in the zone, whilst also taking account of internal environmental conditions, and the specific operating requirements of the zone. A BMS can help manage energy demand whilst achieving comfort for users, tenants and residents of buildings. As data is also consolidated within a single system, a BMS can improve reporting and decision making, supporting better building performance and reductions in energy use and GHG emissions.

#### Metering

Metering systems are products that are specifically designed to measure energy consumption, record, and distribute metered energy data, and analyse and report on energy consumption. They can be termed as sub metering systems which are capable of measuring the consumption at a local level and can be permanent aM&T (Automatic Monitoring & Targeting), or fitted as a temporary measure to assess energy usage in different locations through portable energy monitoring equipment. Metering, including half hourly metering can provide useful information to understand how energy is being used by the building and by the energy consuming plant. This information can help optimise the building, improve energy efficiency and drive energy and cost and carbon reductions.

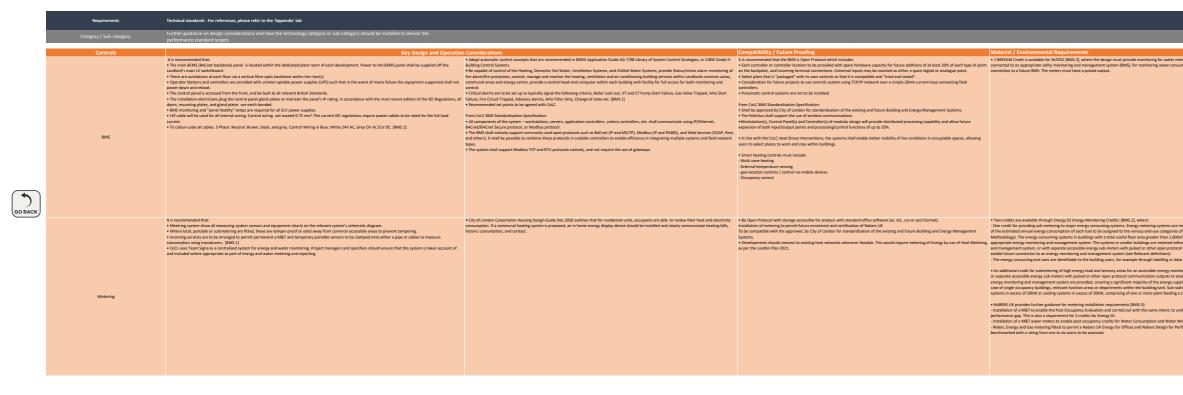
GO BACK

### **TECHNOLOGY GUIDE - PERFORMANCE STANDARDS**

			New build	Refurb		Residential Commercial
Requirements	Performance Requirements	Measurement Standards / Test Conditions	Ass	set Type	E	Building T
Category / Sub-category	Performance standards and specifications from industry standards, regulations and guidance to set the CoLC Standard					
Controls						
BMS Performance Threshold and Requirements	Building Regulations Part L:  • For heating systems, controls shall be wired to fully switch off the heating appliance and pumps when no demand. • Domestic control systems for heating systems shall be installed in accordance with BS 5864. Ductwork to BS 5422. Building Regulations Part F:  • Manual Control, where provided, should be within reasonable reach of the occupants. • Ventilation should be controllable either manually or automatically. • Controls with fans providing intermittent spaces with no window openings shall continue to operate the fan at least 15 minutes after the room is vacated. Energy Technologies List: • Control the to automatically control the individual environmental conditions in one or more zones within a building based on activity status and occupancy levels. • Set with at least 2 of the following operating modes: • normal/comfort mode • economy standby when unoccupied • off mode is switched off or operated at minimum level for fabric frost and equipment protection. Allows users to switch the zone manually to economy or off modes without disabling automatic zone controls.	Building Regulations: Approved Document L1 2021 [CHW.5] Building Regulations: Approved Document F 2021 [CHW.6] Building Regulations: Approved Document F 2021 [HR.2] Cybersecurity – The system shall comply with the IEC 62443 series of standards d [BMS.4] From CoLC BMS Standardisation Specification: Network Controllers shall be tested and certified by the BACnet Testing Laboratory (BTL). [BMS.13] Energy Technologies List Accuracy of sensors: Conform to BS EN 15500-1:2017. [BMS.5] Controls capable of functioning in an EN 15232 Class A System. [BMS.6] Conform with the requirements of The Electromagnetic Compatibility Regulations 2016 or have an appropriate Conformity Assessment mark [BMS.7]	ι. √			• •
Metering Performance Threshold and Requirements	Threshold Performance: Building Regulations part L: • The Building Regulations part L require energy meters to be provided to allow the use of fuel and power consumption to be monitored, and enable at least 90% of the estimated annu energy consumption of each fuel to be assigned to the various end-use categories (heating, lighting etc.) with separate monitoring of any renewable systems. • Buildings with a total floor area greater than 1,000m ² are also required to have automatic meter reading and data collection facilities. • For heating systems, controls shall be wired to fully switch off the heating appliance and pumps when no demand. • Domestic control systems for heating systems shall be installed in accordance to BS 5864. Ductwork to BS 5422. Building Regulations Part F: • Manual Control, where provided, should be within reasonable reach of the occupants. • Ventilation should be controllable either by manual or automatic. • Controls with fans providing intermittent spaces with no window openings shall continue the fan to operate at least 15 minutes after the room is vacated. Additional Performance Standard Energy Technologies List • Shall be capable of: automatically capturing, retrieving, and storing energy metering data of electrical, gas and heat use electronically. Software should enable energy use by means of visualising energy performance data. • Apply separate submetering for specialist systems: Oil fuel flow, compressed air, and steam systems. • Minimum storage of data: half hourly. With data transferred to a data store on a scheduled basis. Data to be retained for a minimum of 2 years. • Software to be capable of identifying failure, missing data, issue with collection of data. Data should be cable of being collated and exportable in a standard format (ASCII or CSV format). Portable meters shall use Total Harmonic Distortion to measure energy usage and power quality, including logging of voltage dips and transients.	<ul> <li>Electricity meters shall meet the accuracy requirements of one of the following:</li> <li>BS EN62053-21:2003, "Electricity metering equipment (ac) – Particular requirements - Part 21: Static meters for active energy (classes 1 and 2)". [BMS.8]</li> <li>BS 8431:2010, "Electrical static metering for secondary or sub-metering. Specification" (BSI, ISBN 0 580 451178). Classes 1 or 2. [BMS.9]</li> <li>Gas meters shall meet the accuracy requirements of one of the following standards:</li> <li>BS EN12261:2002, Gas Meters - Turbine gas meters. [BMS.10]</li> <li>BS EN12480:2015, Gas Meters - Rotary displacement gas meters. [BMS.11]</li> <li>BS EN1359:1999, Gas Meters - Diaphragm gas meter. [BMS.12]</li> </ul>	J			• •

139
-----

## **TECHNOLOGY GUIDE - TECHNOLOGY STANDARDS**



	New build	Refurb	Listed	Resi den tial	Com merci al	Public (e.g. Schools)	City of London Documents and Guidance	Loc aton and Decorption	Project Management	Mechanical Engineer	Electrical Engineer	Architect	Public Health Engineer	Fire Engineer	Contractor	Building FM / End User
	A	iset T	ype	Bui	lding '	Туре	City Task Bar	r of London Document Interlinks (TBC) PPG Activities			Key	Stake	2hold	ers		
ters. Each uage point shall be imption or a system that enables	~	~	×		4	¥	<ol> <li>CoLC BENS Standardisation Specification</li> <li>Climate Action Srategy 2020- 2027</li> <li>City of London Carporation Housing Design Guide Dec 2020</li> </ol>	1) CoLC Standards to be adopted to ensure modern design components are used, common philosophy is adopted across all assets and are compatible for future distributed processing capability across multiple assets 2) in line with the CoLC Olimate Action Strategy 2020- 2027, the systems all maximise the use of renewable, aim for BREAM Ecollemit Rating. 3) Further guidance on designing domestic Controls can be found in the Glowing. The Domestic Bullen Domestic Ventilation Compliance Guide (NIS, 2013) set and for communal system, the Non-Domestic Building Services Compliance Guide (NIS, 2013) set for different systems. Guidance on design of control for different systems. Guidance on design of control proteins signed in the Distrib Cortoria Nadarty good design and implementation (ECA, 2007). All contractors to use to reque screed/verse. Staffar and mice model on CoLC projects.		4	5		•	5	4	~
ntalies, that exable at loast 90% of energy comuning systems (see "are materies during an er with an energy monitoring is communication outputs, to a outputs. Urang and management system to the second system include boller common system. derstand and close the lenitoring (Wai 018 Wei 02). formance to be undertaken and	~	~	~		~	J	City of London Corporation Housing Delaying Guide Dec 2020	For residential units, occupants should be able to review their heat and electricity consumption. If a regreg display review shall be straidler. This should clearly communicate heating bills, historic communicate heating bills, historic communicate heating bills, historic communicate heating bills, historic communicate heating bills, historic communicates of complexes and the found in the following: The Domestic Linding Services Compliance Guide (INS, 2013) and the Domestic Verifiliance Compliance Guide (INS, 2013) and the Domestic Verifiliance Compliance Guide (INS, 2013) and the Domestic Verifiliance Compliance Guide (INS, 2013) and and immirum recommended control regularements for different systems. Guidance on design of control out minimum recommended control regularements for different systems. Guidance on design of control apped design and implementation (IRC), 2007, All contractors to use torque screend/views calibrated apped design and implementation (IRC), 2007, All contractors to use torque screend/views calibrated Smart heating controls must include: - Multi cane heating - ge-location controls / control via mobile devices		~	~		•		~	~

### RENEWABLES

#### **Overview**

The UK's energy system is currently dominated by the use of fossil fuels and will need to change dramatically if we are to achieve net zero emissions. Decarbonising the energy system over the coming decades means replacing fossil fuels with 'clean' energy technologies such as renewables. Renewable energy is energy that is collected from resources that are naturally renewed, such as sunlight, wind, water movement, and geothermal heat. Solar thermal is covered in the Domestic Hot Water Section. Wind energy is not included in this section - whilst this is a viable technology at large scale, it has not yet been shown to be viable in the urban environment.

#### Interdependencies

Solar Hot Water needs to be specified with centralised hot water generation and sized for the hot water demand. Solar PV and battery storage need to be optimised to the building's electricity consumption. For roof top renewables technologies, consideration should be made for their installation when roof improvements/ relevant maintenance activities are being undertaken.

## Solar Photovoltaics (PV) and Battery Storage

Photovoltaics (often shortened as 'PV') gets its name from the process of converting light (photons) to electricity ('voltage'). PV cells are made of multiple layers of semiconductor material, with one positive charged and negatively charged. When light enters the cell, some of the photons from the light are absorbed by the semiconductor, freeing electrons from the cell's negative layer to flow through an external circuit and back into the positive layer. This flow of electrons produces electric current. To increase their utility, dozens of individual PV cells are interconnected together in a sealed, weatherproof package called a module. These modules can build up flexibility of PV arrays which can be located on buildings such as the roof or facade or ground mounted.

PV power is generated as Direct Current (DC) and converted to Alternating Current (AC) for use in buildings and the grid by an invertor. Battery storage can be specified alongside solar PV to maximise the use of energy generated by a PV on site, or optimise the export to grid at time where a higher sale price can be realised. Lithiumion batteries are by far the most popular battery storage option today and control more than 90% of the global grid battery storage market for both vehicles and stationary uses. However, this market is evolving quickly with flow batteries and solidstate batteries increasing in market share.

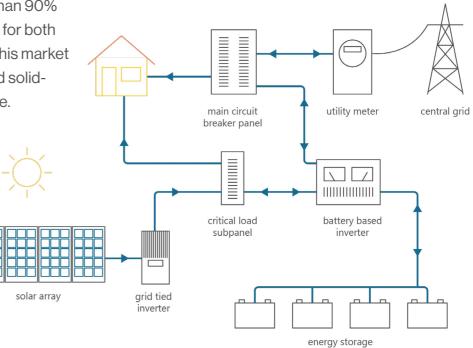


Figure 29 Example schematic of an Ground-Air Heat Exchanger

### COMPONENTS

#### **Overview**

The components section covers major pieces of equipment in HVAC systems

#### Interdependencies

Fans should be sized accordingly with the ventilation rates required across the building. Where heating or cooling is provided by an air distribution system, the fan should be sized accordingly with the heat load delivered. Refrigerant selection will be based on heating and cooling loads required to serve the building.

Where hot water is provided by the main heat source of the heating system, the heat source is to be adequately sized to provide hot water at 60°C at peak demand. Key interdependencies for refrigerants are the heating and cooling plant that they are used in. For water quality this will also impact on the heating, cooling, domestic hot water services and other systems where water quality could impact the performance of the service.

#### Pumps

A pump is a mechanical device used to force a fluid (a liquid or a gas) to move forward inside a pipeline or hose. They are also used to produce pressure by the creation of a suction (partial vacuum), which causes the fluid to rise to a higher altitude.

#### Fans

Fans can be found in ventilation, heating and cooling (HVAC) systems within the fixed building services and can use up to 40% of all electricity of these systems.

Fans are designed to move the required airflow through a system, overcoming the total pressure loss. The characteristics of a fan can be obtained from manufacturers, and these would be based on standard testing methods measuring the performance of a fan, including volume flow rate and pressure over a range of conditions. There are a number of measures to optimise the use fans including the inclusion of variable speed drives on the motors which matches to the motor speed with demand and leads to energy, cost and carbon savings.

Generally, there are 3 main types of fans:

- Axial the gas flows straight through the fan along the axis of rotation. Axial fans are generally used for high airflows and not high pressures.
- **Radial** the gas is drawn in an axial direction and leaves the impeller of the fan at right angles to the axis of rotation
- Crossflow the air moves across the diameter of the impeller. Crossflow fans are generally used in split-systems.

Refrigerants are a working fluid used for their physical properties which enables them to transfer heat from one area and remove it to another. Devices that use refrigerants to perform this function are used for cooling such as chillers, fridges, freezers, and also plant that provides heating such as heat pumps. Refrigerants are used in the vapour compression cycle. During this cycle the refrigerant is forced to change phase from liquid to gas and vice versa and during these phase changes the refrigerant will pick up or release heat. There are many types of refrigerants with different physical properties depending on the temperature requirements of the application.

Greenhouse gases like carbon dioxide and emissions from some refrigerants are contributors to global warming. This Global Warming Potential (GWP) of refrigerants is measured against carbon dioxide which has a GWP of 1. Some refrigerants also can have an impact on the ozone layer. This is described by a refrigerant's Ozone Depleting Potential (ODP) value, which refers to the relative harmfulness of a substance to the ozone layer (on a scale of 1-10). A further measure called Total Equivalent Warming Impact (TEWI) refers to the indicates the amount of greenhouse gases generated by a refrigeration plant in kilograms (kg) of carbon dioxide – but includes both the direct GWP impacts and the indirect impact of power consumption used by the equipment.

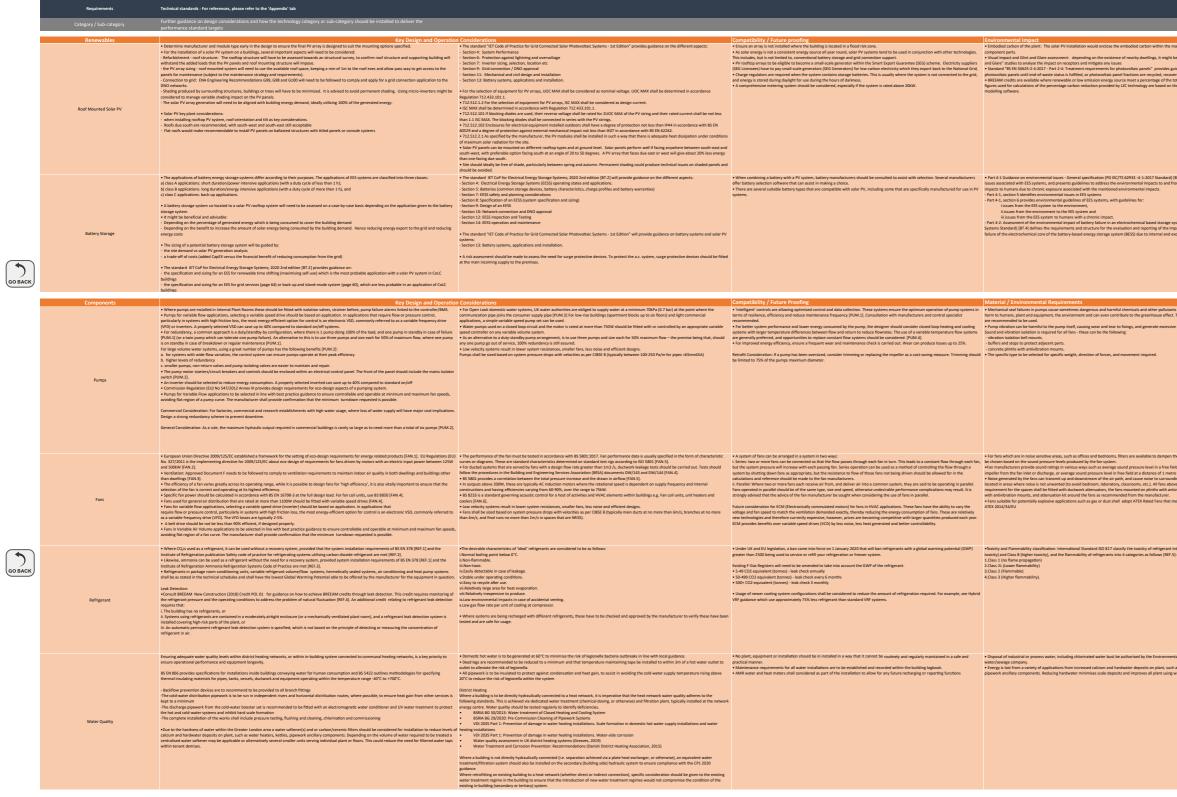
#### Water Quality

The term 'water quality' refers to the chemical, physical and biological composition of water in relation to the use that it is intended for. In the UK, water is generally supplied to consumers using a pump and pipe system, which is managed by regional water companies. Water is typically drawn from rainwater in reservoirs, rivers or from groundwater and then pumped to water treatment works. At this stage the purity of water is ensured and tested. Chlorine may be added at this stage to kill any pathogens. The treated water is then stored and sent to the user via a distribution network. This section outlines measures to ensure water quality is monitored and maintained in buildings. GO BACK

### **TECHNOLOGY GUIDE - PERFORMANCE STANDARDS**

			New build	Refurb Listed	Residential	Commercial Public (e.g. Schools)
Requirements	Performance Requirements	Measurement Standards / Test Conditions	As	set Type	Bu	uilding Type
Category / Sub-category	Performance standards and specifications from industry standards, regulations and guidance to set the CoLC Standard					
Renewables						
<b>Roof-Top Solar PV</b> Performance Threshold and Requirements	There are no specific performance requirements in standards for integrated solar PV systems. Key elements to consider for key components when specifying and some recommended threshold levels are below: Installing solar PV modules in the industrial "Bloomberg Tier 1 List PV Modules Use panels with the following requirements: • Module Efficiency: Not less than 20% • Degradation: rated power at Standard Test Condition (STC), the PV modules shall have a power warranty of minimum of 80% at STC after 25 years and 90% after 10 years • Panel product warranty: PV modules manufacturers would normally provide a product warranty of 25 years Specifying the unitary capacity of the PV panels (for instance, request a rated power at STC >300Wp with no negative tolerance allowed) will need to be agreed between client and installers (it would be highly dependent on the roof available area, dimensions or shape). • For the Inverters, some requirements towards the following key aspects (Efficiency and Lifetime) might be worth considering, but we would recommend to be agreed between client and installers • Efficiency:>98% • Expected inverter replacement: > year 12 of operation (due to drop in efficiency) • Total Harmonic distortion:Less than 3%	BS EN 15316-4-3:2017 Energy performance of buildings — Method for calculation of system energy requirements and system efficiencies [PV 1] Bloomberg Tier 1 List PV Modules Methodology : https://data.bloomberglp.com/professional/sites/24/BNEF-PV-Module-Tier-1-List- Methodology.pdf Example, most updated list (Nov. 2022) https://www.renvu.com/Tier-1-Solar-Panels-List-2022 [PV 4]		å	~	~ ~
Battery Storage Performance Performance Threshold and Requirements	There are no specific thresholds or performance requirements for Energy Storage Systems as this is a relatively new technology. Key considerations when evaluating this technology in the future will be discharge time, maximum cycles or lifetime, energy density and overall efficiency	IEC 62933-Electrical energy storage (EES) systems [PV 3]	~	å	~	√ √
Companyate						
Components Pump Performance Performance Threshold and Requirements	Circulators/pumps should have class A energy efficiency rating as per EU legislation and pump motor with minimum IE4 (Super Premium Efficiency) with respect to IEC 60034-30-1. For motors which drive the fan system, the efficiency should adhere to Schedule 16, Ecodesign requirements for electric motors and variable speed drives. These provide minimum efficiencies (nn) for IE3, and IE4 motors at different frequencies and rated power. Pumps have Eco-design regulations that are required to be met as a minimum. Commission Regulation (EU) No 547/2012 Annex III provides minimum efficiency index (MEI) and its corresponding C-value depending on the pump type and speed.	BS EN ISO 12100:2010, General principles for design. Risk assessment and risk reduction. [GN.3] BS EN ISO 13857: 2019, Safety of Machinery. Safety distances to prevent hazard zones being reached by upper and lower limbs. [CP1] BS EN ISO 13854: 2019, Safety of Machinery. Minimum gaps to avoid crushing of parts of the human body. [CP2] BS EN ISO 809: Establishes safety requirements relating to the construction, assembly, erection, operation and servicing of rotodynamic, rotary positive displacement and reciprocating displacement pumps and pump units.CP3]	V	å	V	√ √
Fans Performance Performance Threshold and Requirements	Specific fan powers (SFP) in air distribution systems in new buildings (existing buildings are provided in brackets) should be no more than:  Central balanced mechanical ventilation system with heating and cooling 2.0 (2.6) Central balanced mechanical ventilation system with heating only 1.9 (2.2) All other central balanced mechanical ventilation systems 1.5 (2.0) Conal supply system where fan is remote from zone, such as ceiling void or roof-mounted units 1.1 (1.4) Conal extract system where fan is remote from zone, such as ceiling void or roof units 2.3 (2.3) Conal balanced supply and extract ventilation units, such as ceiling void or roof units 2.3 (2.3) Local balanced supply and extract ventilation units, such as ceiling void or roof units 2.0 (2.0) Local supply or extract ventilation units, such as ceiling void or roof units 2.0 (2.0) Local ventilation supply or extract ventilation units, such as window/wall/roof units 2.0 (2.0) Local ventilation supply or extract ventilation units, such as window/wall/roof units 2.0 (2.0) Local supply or extract ventilation in units, such as window/wall/roof units (e.g. toilet extract) 0.3 (0.4) Conter local ventilation supply or extract units 0.5 (0.5) Fan assisted terminal variable air volume (VAV) unit 0.5 (0.5) Fan coil unit (rating weighted average) 0.4 (0.4) Kitchen extract, fan remote from zone with grease filter 1.0 (1.0) For motors which drive the fan system, the efficiency should adhere to Schedule 16, Ecodesign requirements for electric motors and variable speed drives. These provide minimum efficiencies (nn) for IE3, and IE4 motors at different frequencies and rated power. Fans have Eco-design regulations that are required to be met as a minimum. Commission Regulation (EU) No 327/2011 provides a calculation methodology along with target efficiency for certain fan types. The fan overall efficiency negule termination that are required to be met as a minimum. Commission Regulation (EU) No 327/2011 provides a calculation methodology along with target efficiency fo		V	√ •	V	~ ~
Refrigerants Performance Performance Threshold	Threshold Performance - Global Warning Potential (GWP)         - Single split air conditioners with a refrigerant charge below 3kg = <750 GWP	Toxicity and Flammability classification: International Standard ISO 817 classify the toxicity of refrigerant [REF.5] Where the building uses refrigerants, in existing or new installed systems and plant: • all systems must comply with the requirements of EN 378:2016 and EN 378-2:2016	V	•••	~	√ √
Refrigerants Performance	Global Warming Potential	BREEAM New Construction (2018) [REF.4]	1		./	
Performance Threshold Water quality Performance Threshold and Requirements	For new buildings (and where feasible all buildings) any refrigerants used should have a global warming potential (GWP)≤10. Prescribed concentrations and values of microbiological and chemical parameters are set out, along with their measurement points and frequencies within the Water Supply (Water Quality) Regulations 2018 directive and national requirements. Of particular importance are data points measured at consumers taps as the point of compliance. The Heat Networks Code of Practice (CP1 2020) defines requirements for the water quality within district heating networks.	The Water Supply (Water Quality) Regulations 2018 [WQ.7] The Heat Networks Code of Practice (CP1 2020) [HP.17]	√	•••	√	✓ ✓ ✓ ✓

### **TECHNOLOGY GUIDE - TECHNOLOGY STANDARDS**



_	> New build	Quingaa Sseet Ty	Listed	Residential	Com mercial	Public (e.g. Schools)		of London Document Interfinits (TBC) PPG Activities	Project Management	Mechanical Engineer	Electrical Engine er	Architect	Public Health Engineer	sia Fire Engineer	Contractor	Building FM / End User
anufacturing process of all its or required to undertake "Glint vidance to the treatment of and building energy demand, the he output from approved energy	J	J.	•	V	J	J	NA	NA		\$	~	~			~	~
87.3] describes environmental om EES systems including the patern (BS EN IEC 62933-4-2 EES pact on the environment, from a rogenous causes.	J.	J	•	1	V	~	NA	NA		~	~	~			~	~
s to leak that can cause seriou To avoid this, seal less pumps noise to surrounding areas.	J	~	J	~	J	√	NA	м			~		~		~	~
he noise levels, these filters can did at a distance of 3m from the form the fan inter or discharge- ling areas. Systems shall be use he NR (Noise Stang) wibration mounts or suspended weet the requirements of the	¥	4	v	~	~	~	NA	NA			~				~	~
nto 2 categories of Class A βower }:	V	V	J	~	\$	4	CoLC Broad Street Place Mechanical Specification	Section M100400: Provides compliance requirements for refrigerants			~		~	~	~	~
cal Regulator of the local as water heaters, kettles, water.	J	J.	¥	V	¥	J	NA	м		4	\$	5			~	~

### BEST AVAILABLE TECHNOLOGY ASSESSMENT GUIDANCE

The Best Available Technology (BAT) process has been developed to ensure that evidence is provided that the most appropriate technology has been chosen for the CoLC project. This approach will be similar for all Technology Categories where options are available. It is recommended the BAT assessment is undertaken for all projects for each Technology Category or an explanation is provided why it would not be appropriate.

See the BAT as a process TAB in the spreadsheet found **Chere.** 

#### The Best Available Technology (BAT)

The following section provides a summary of the activities that should be followed to provide evidence that the Best Available Technology (BAT) has been chosen for the CoLC project. This approach will be similar for all Technology Categories where options are available. It is recommended the BAT assessment is undertaken for all projects for each Technology Category or an explanation is provided why it would not be appropriate.

Topits		Strategic definition, preparation and brief	Concept design	Developed design	Technical design	Construction	Handover and close out	In Use
	Gateway 1	Gateway 2	Gateway 3	Gateway 4	Gateway 4	Gateway 5	Gateway 6	None
	RIBA 0	RIBA 1	RIBA 2	RIBA 3	RIBA 4	RIBA 5	RIBA 6	RIBA 7
BAT Guidance	requirements including the energy and carbon targets (including net zero) targets should be undertaken.	Technology Long List and Short List Selection: Evidence of optioneering process of potential technologies and initial decision tree assessment based on building type and project. 1. Long List Selection: Develop a long-list of suitable technologies (sub-categories) that may be suitable of the project. Identify interdependencies with other technology categories. Any Clearly unsuitable technologies should be removed from the Long List. Ensure that interaction and interplay between other technical "Categories" is considered at this stage and fed back into long list options. 2. Short List Selection: An initial review of the shor list of technologies should then be developed usin a technology decision tree assessment based on information in LEI Climate Emergency Design guidance and CIBSE TMS3 Refurbishment for non- domesit buildings. Ensure that interaction and interplay between other technical 'Categories' is considered at this stage and fed back options assessment.	design and delivery requirements including, space, utility requirements, planning and interdependencies with other building services and fabric. (b) Technology is future-proofed with respect to GHG mitigation and resilience to climate risk 2. Carbon Emissions: (a) Minimise operational carbon emissions (based CIBSE TMS4 Evaluating Operational Energy Performance at the Design Stage, or similar). (b) Moreoversity of comparison of technologies that missiona whose	requirements should be developed for key technologies such as heating, cooling, domestic hot water, ventilation and renewables to ensure that the technology is performing as the	Construction Phase evidence should be gathered from suppliers to confirm that the technology meets the Performance	the technology meets the Performance		Monitoring and Reporting 1. fased on the monitoring approach developed at the Design Stage, undertake regular monitoring and collection of operational energy data to confirm BAT and the Performance Standards outlined in this Net Zero Technology Guide have been met. This should be undertaken for at least 3 year's after contract completion.

# 

#### Introduction

This section identifies the sources of industry good practice which were used to develop the Technical and Performance requirement tables.

Ref.	Source
GN.1	Department for Levelling Up, Housing & Communities (2022). Approved Docu- ment L, Conservation of fuel and power, Volume 1: Dwellings.
GN.2	Department for Levelling Up, Housing & Communities (2022). Approved Document L, Conservation of fuel and power, Volume 2: Buildings other than dwellings.
	ISO 12100:2010
GN.3	Safety of machinery — General principles for design — Risk assessment and risk reduction
GN.4	Standard Assessment Procedure (SAP 10)
Building F	abrics
Wall Insula	tion
WL.1	BRE. (2009). BR443: Conventions for U-Value calculations.
WL.2	The Home Office. (2020). Fire Safety Bill. UK Government.
WL.3	The Forest of Dean, Cotswold and West Oxfordshire District Councils. (2021). Net Zero Carbon Toolkit.
WL.4	Department for Business, Energy & Industrial Strategy. (2021). Retrofit Internal Wall Insulation: Guide to Best Practice.
WL.5	UK Government. (2010). The Building Regulations 2010: UK Statutory Instru- ments - 2010 No.2214 Schedule 1. London.
WL.6	British Standard Institution. (2013). BS 6093:2006 Design of joints and jointing in building construction - Guide (+A1:2013). London.
WL.7	British Standard Institution. (2010). BS 6213: 2000 Selection of construction sealants. Guide (+A1:2010). London.
WL.8	Bristol City Council. (2015). A Bristolian's Guide to Solid Wall Insulation.
WL.9	Department for Levelling Up, Housing & Communities, (2022). Approved Document L, Conservation of fuel and power, Volume 1: Dwellings.
WL.10	British Standards Institution. BS 5250: 2021 Management of moisture in build- ings – Code of practice. London.
WL.11	British Standards Institution. BS EN 12831-1: 2017. Energy performance of buildings - method for calculation of the design heat load. Space heating load, module M3-3.

WI.12	Department for Levelling Up, Housing & Communities, (2021). Approved Document O, Overheating.
WI.13	CIBSE, (2014). TM49: Design summer years for London, London.
WI.14	British Standards Institution. (2019). PAS 2035 Retrofitting Dwellings for Improved Energy Efficiency – Specification and Guidance. London.
WI.15	Department for Business, Energy & Industrial Strategy. (2022). Retrofit Room in Roof Insulation. UK Government.
Roof Insula	ation
RI.1	Department for Levelling Up, Housing & Communities, (2022). Approved Docu- ment L, Conservation of fuel and power, Volume 1: Dwellings.
RI.2	Department for Business, Energy & Industrial Strategy. (2022). Retrofit Room in Roof Insulation. UK Government.
RI.3	UK Government. (2010). The Building Regulations 2010: UK Statutory Instru- ments - 2010 No.2214 Schedule 1. London.
RI.4	The Forest of Dean, Cotswold and West Oxfordshire District Councils. (2021). Net Zero Carbon Toolkit.
RI.5	British Standards Institution. (2019). PAS 2035 Retrofitting Dwellings for Improved Energy Efficiency – Specification and Guidance. London.
RI.6	BRE. (2019). BR443: Conventions for U-Value calculations.
RI.7	The Home Office. (2020). Fire Safety Bill. UK Government.
RI.8	The Renewable Energy Hub. (2022). Type of Insulation. [Online] 2018. [Cited: October 11, 2022.] https://www.renewableenergyhub.co.uk/main/insulation-in- formation/types-of-insulation/.
RI.9	Department for Levelling Up, Housing & Communities, (2021). Approved Document O, Overheating.
RI.10	CIBSE, (2014). TM49: Design summer years for London, London.
Windows	& Doors
W.1	Department for Levelling Up, Housing & Communities, (2022). Approved Docu- ment L, Conservation of fuel and power, Volume 1: Dwellings.
W.2	British Standards Institution. (2016). BS 8213-4:2016 Windows and doors. Code of practice for the survey and installation of windows and external door sets. Chiswick.
W.3	CIBSE. (2005). AM10: Natural ventilation in non-domestic buildings. London: CIBSE Publications.
W.4	NHBC Standards, (2022). 6.7 Doors, Windows and Glazing [Cited: October 13, 2022.] https://nhbc-standards.co.uk/6-superstructure-excluding-roofs/6-7- doors-windows-and-glazing/6-7-7-glazing/.

W.5	British Standards Institution. (2015). BS 6375-1:2015 Performance of windows and doors. Classification for weathertightness and guidance on selection and specification (+A1:2016). Chiswick.
W.6	Historic England. Types of Work to Older Houses. [Online] Historic England, 2022. [Cited: October 13, 2022.] <u>https://historicengland.org.uk/advice/your-</u> home/making-changes-your-property/types-of-work/alter-my-windows/.
W.7	BRE. (2012). IP 22/12 Site layout planning for sunlight and solar gain. Bracknell: IHS BRE Press.
W.8	CIBSE. (2014). LG10: Daylighting - a guide for designers. London.
W.9	British Standards Institution. (2018). BS EN 17037:2018 Daylight in buildings (+A1:2021) (Incorporating corrigendum October 2021). Chiswick.
W.10	British Standards Institution. (2000). BS 6213:2000 Selection of construction sealants. Guide (+A1:2010). Chiswick.
W.11	LETI. (2020). LETI Climate Emergency Design Guide.
W.12	British Standards Institute. BS 476-22:1987 Fire tests on building materials and structures. Methods for determination of the fire resistance of non-loadbearing elements of construction, Chiswick. 1987
Floor Insul	ation
FI.1	Department for Levelling Up, Housing & Communities, (2022). Approved Docu- ment L, Conservation of fuel and power, Volume 1: Dwellings.
Fl.2	Department for Business, Energy & Industrial Strategy. (2022). Solid floor insulation: guide to best practice. London.
FI.3	Department for Business, Energy & Industrial Strategy. (2022). Guide to Best Practice: Retrofit Floor Insulation - Suspended Timber Floors. London.
FI.4	British Standards Institution. BS 5250: 2021 Management of moisture in build- ings – Code of practice. London, 20201.
FI.5	UK Government. The Building Regulations 2010: UK Statutory Instruments - 2010 No.2214 Schedule 1. London, 2010.
FI.6	BRE. IP 1/06 Assessing the effects of thermal bridging at junctions and around openings. Bracknell. IHS BRE Press, 2006.
FI.7	Department for Levelling Up, Housing & Communities, (2021). Approved Docu- ment O, Overheating, 2021
FI.8	CIBSE, (2014). "TM49: Design summer years for London," London.
Fl.9	British Standards Institution. PAS 2035 Retrofitting Dwellings for Improved Energy Efficiency – Specification and Guidance. London, 2019.
FI.10	Department for Business, Energy & Industrial Strategy. (2022). Retrofit Room in Roof Insulation. UK Government.

Draught-p	roofing
DP.1	Bere Architects. (2012). Airtightness Report: Practical guidance to achieve excellent levels of airtightness in Passivhaus building fabric. London.
DP.2	CIBSE. (2022). Tightening up: TM23 Testing building for air leakage. CIBSE Journal.
DP.3	Passivhaus Trust. (2020). Good Practice Guide to Airtightness. London.
DP.4	The Forest of Dean, Cotswold and West Oxfordshire District Councils. (2021). Net Zero Carbon Toolkit.
DP.5	CIBSE, (2019). Module 141: MVHR for energy-efficient ventilation and summer cooling. CIBSE Journal.
DP.6	Department for Levelling Up, Housing & Communities, (2021). Approved Document O, Overheating.
DP.7	CIBSE, (2014). TM49: Design summer years for London, London.
DP.8	GreenSpec. (2022). Airtight Construction. greenspec.com. [Online] 2022. [Cited: October 17, 2022.] https://www.greenspec.co.uk/building-design/ airtight-construction/#:-:text=Some%20typical%20materials%20used%20 for,and%20specifically%20designed%20airtight%20membranes.
DP.9	British Standards Institution. (2019). PAS 2035 Retrofitting Dwellings for Improved Energy Efficiency – Specification and Guidance. London.
DP.10	Department for Business, Energy & Industrial Strategy. (2022). Retrofit Room in Roof Insulation. UK Government.
Heating	
Heat Pum	8
HP.1	European Standards, (2020). BS EN 378-3:2016+A1:2020 Refrigerating systems and heat pumps. Safety and environmental requirements Installation site and personal protection.
HP.2	Department for Levelling Up, Housing & Communities (2022). Approved Docu- ment L, Conservation of fuel and power, Volume 1: Dwellings.
HP.3	Department for Levelling Up, Housing & Communities (2022). Approved Document L, Conservation of fuel and power, Volume 2: Buildings other than dwellings.
HP.4	BS EN 14825: 2022. Air conditioners, liquid chilling packages and heat pumps, with electrically driven compressors, for space heating and cooling, commercial and process cooling - testing and rating at part load conditions and calculation of seasonal performance.
HP.5	CIBSE (2016) Guide B2 Ventilation and Ductwork.
HP.6	CIBSE, (2022). AM17: Heat pump installations for large non-domestic proper- ties, London.

HP.7	Microgeneration Certification Scheme (2021). MIS 3005-D: The Heat Pump Standard (Design).
HP.8	Microgeneration Certification Scheme (2018). MCS 007: Product Certification Scheme Requirements – Heat Pumps.
HP.9	CIBSE (2009). Guide H: Building Control Systems, London.
HP.10	BRE (2016). Soakaway Design DG 365 – 2016.
HP:11	BRE (2013). BREEAM International New Construction 2013 - Pol 01: Impact of Refrigerants. [Online]. Available: <u>https://kb.breeam.com/wp-content/plugins/</u> <u>breeamkb-pdf/pdf/?c=266.</u> [Accessed 02 08 2022].
HP:12	CIBSE (2015). Guide A: Environmental Design (updated 2021).
HP:13	UK Government, (2015). The Town and Country Planning (General Permitted Development) (England) Order, 2015.
HP:14	CIBSE (2012). Module 36: Air Source Heat Pumps, London.
HP:15	CIBSE (2016). Guide B1 Heating, London.
HP:16	CIBSE (2013). TM51 Ground Source Heat Pumps, London.
HP.19	CIBSE (2020). CP1 Heat Networks: Code of Practice for the UK, London.
HP.20	BS EN 15450: 2007. Heating systems in buildings. Design of heat pump heating systems.
HP.21	$BS \operatorname{EN}$ 15450:2007 Heating systems in buildings - Design of heat pump heating systems
HP.22	European Commission: Commission Regulation (EU) 2016/2281 - Ecodesign requirements for the Heating and Cooling
HP.23	European Standard BS EN 14825:2016: Air conditioners, liquid chilling packag- es and heat pumps, with electrically driven compressors, for space heating and cooling - Testing and rating at part load conditions and calculation of seasonal performance
Boilers	
B.1	CIBSE (2016) Guide B2 Ventilation and Ductwork.
B.2	CIBSE, (2022). AM17: Heat pump installations for large non-domestic proper- ties, London.
B.3	Historic England. Heating Systems for Historic Buildings. Historic England. [Online] https://historicengland.org.uk/advice/technical-advice/building-ser- vices-engineering/heating-historic-buildings/heating-systems-for-histor- ic-buildings/.

B.4	Department for Levelling Up, Housing & Communities (2022). Approved Document L, Conservation of fuel and power, Volume 2: Buildings other than dwellings.
B.5	BS EN 303-3:1999 Heating boilers. Heating boilers with forced draught burners. Gas fired central heating boilers. Assembly comprising a boiler body and a forced draught burner
B.6	BS EN 15502-2-1:2012 Gas-fired central heating boilers. Specific standard for type C appliances and type B2, B3 and B5 appliances of a nominal heat input not exceeding 1000 kW (+A1:2016) (incorporating corrigendum February 2015) (Withdrawn)
B.7	BS EN 483:1999+A4:2007 Gas-fired central heating boilers. Type C boilers of nominal heat input not exceeding 70 kW
B.8	BS EN 677:1998 Gas-fired central heating boilers - Specific requirements for condensing boilers with a nominal heat input not exceeding 70 kW (Withdrawn)
B.9	BS EN 303-7:2006 Heating boilers. Gas-fired central heating boilers equipped with a forced draught burner of nominal heat output not exceeding 1000 kW
B.10	BS EN 15502-1:2012+A1:2015 Gas-fired heating boilers. General requirements and tests
B.11	BS EN 15502-2-1:2012 Gas-fired central heating boilers. Specific standard for type C appliances and type B2, B3 and B5 appliances of a nominal heat input not exceeding 1000 kW (+A1:2016) (incorporating corrigendum February 2015) (Withdrawn)
Hybrid Sys	stems
HY.1	CIBSE Journal. (accessed 2022). Designing efficient hybrid heat pump systems. CIBSE Journal. [Online] <u>https://www.cibsejournal.com/technical/</u> designing-efficient-hybrid-heat-pump-systems/.
HY.2	MCS (2020). Domestic Heat Pumps A Best Practise Guide.
HY.3	CIBSE AM17 (2022). Heat pumps for large non-domestic buildings
Electric Co	onvectors
EC.1	BSI (2017). BS EN 12831-1:2017 Energy performance of buildings - method for calculation of the design heat load. Space heating load, module M3-3. London.
EC.2	CIBSE (2016). Guide B1: Heating, CIBSE Publications, London.
EC.3	BSI (2020). BS EN 60335-2-30:2009+A12:2020 - Household and similar electrical appliances. Safety Particular requirements for room heaters.
EC.4	Department for Levelling Up, Housing & Communities, (2022). Approved Document L, Conservation of fuel and power, Volume 2: Buildings other than dwellings.

RH.3       line] CIBSE, [Online] <a href="https://www.cibsejournal.com/cpd/modules/2009-06/">https://www.cibsejournal.com/cpd/modules/2009-06/</a> RH.4       CIBSE (2009). KS14 Energy efficient heating.         Department for Levelling Up, Housing & Communities (2022). Approved Document L, Conservation of fuel and power, Volume 2: Buildings other than dwellings.         District Heating       Department for Levelling Up, Housing & Communities, (2022). Approved Document L, Conservation of fuel and power, Volume 1: Dwellings.         DH.1       Department for Levelling Up, Housing & Communities, (2022). Approved Document L, Conservation of fuel and power, Volume 1: Dwellings.         DH.2       CIBSE, (2020). CP1 Heat networks: Code of Practice for the UK, London.         DH.3       Mayor of London, (2014). London Heat Network Manual.         Future Heating       FH1         Department for Business, Energy, and Industrial Strategy. (2021). Quality Assu ance for Combined Heat and Power – The CHPQA Standard issue 8.         FH.2       CIBSE. (2015). Environmental Design Guide A.         FH.3       IGEM. (2022). Reference Standard for low pressure hydrogen utilisation IGEM/H/1 with amendments June 2022.         Department for Business, Energy, and Industrial Strategy. (2021). Combined Heat and Power – Project development a detailed guide for CHP developers. Parts 1 – 6.         FH.4       Department for Business, Energy, and Industrial Strategy. (2021). Combined Heat and Power – Project development a detailed guide for CHP developers. Parts 1 – 6.         BR		
RH.1       [Online] https://historiceingland.org.uk/advice/technical-advice/building-ser- vices-engineering/heating-historic-buildings/heating-systems-for-histor- ic-buildings/.         RH.2       CIBSE (2016). Guide B1 Heating.         RH.3       CIBSE (2016). Guide B1 Heating.         RH.4       CIBSE (2009). KS14 Energy efficient heating panels. CIBSE Journal. [On- line] CIBSE. [Online] <a href="https://www.cibsejournal.com/cpd/modules/2009-06/">https://www.cibsejournal.com/cpd/modules/2009-06/</a> RH.4       CIBSE (2009). KS14 Energy efficient heating.         Department for Levelling Up. Housing & Communities (2022). Approved Document L, Conservation of fuel and power, Volume 2: Buildings other than dwellings.         District Heating       Department for Levelling Up, Housing & Communities, (2022). Approved Document L, Conservation of fuel and power, Volume 1: Dwellings.         DH.1       Department for Levelling Up, Housing & Communities, (2022). Approved Document L, Conservation of fuel and power, Volume 1: Dwellings.         DH.2       CIBSE, (2020). CP1 Heat networks: Code of Practice for the UK, London.         DH.3       Mayor of London, (2014). London Heat Network Manual.         Future Heating       FH.1         Department for Business, Energy, and Industrial Strategy. (2021). Quality Assu ance for Combined Heat and Power – The CHPQA Standard issue 8.         FH.2       CIBSE. (2015). Environmental Design Guide A.         FH.3       IGEM. (2022). Reference Standard for low pressure hydrogen utilisation IGEM/H/1 with amen	Radiant He	eating
RH.3       CIBSE Journal (2009). Module 5: Radiant heating panels. CIBSE Journal. [On- line] CIBSE, [Online] <a href="https://www.cibsejournal.com/cpd/modules/2009-06/">https://www.cibsejournal.com/cpd/modules/2009-06/</a> RH.4       CIBSE (2009). KS14 Energy efficient heating.         Department for Levelling Up, Housing & Communities (2022). Approved Document L, Conservation of fuel and power, Volume 2: Buildings other than dwellings.         District Heating       Department for Levelling Up, Housing & Communities, (2022). Approved Document L, Conservation of fuel and power, Volume 1: Dwellings.         DH.1       Department for Levelling Up, Housing & Communities, (2022). Approved Document L, Conservation of fuel and power, Volume 1: Dwellings.         DH.2       CIBSE, (2020). CP1 Heat networks: Code of Practice for the UK, London.         DH.3       Mayor of London, (2014). London Heat Network Manual.         Future Heating       FH.1         Department for Business, Energy, and Industrial Strategy. (2021). Quality Assu ance for Combined Heat and Power – The CHPQA Standard issue 8.         FH.2       CIBSE. (2015). Environmental Design Guide A.         FH.3       IGEM. (2022). Reference Standard for low pressure hydrogen utilisation IGEM/H/1 with amendments June 2022.         FH.4       Department for Business, Energy, and Industrial Strategy. (2021). Combined Heat and Power – Project development a detailed guide for CHP developers. Parts 1 – 6.         FH.5       BRE Trust, (2018). BREEAM New Construction 2018 (UK) [Online] https://filestheat and Power – Project	RH.1	[Online] https://historicengland.org.uk/advice/technical-advice/building-ser- vices-engineering/heating-historic-buildings/heating-systems-for-histor-
RH.3       line] CIBSE, [Online] <a href="https://www.cibsejournal.com/cpd/modules/2009-06/">https://www.cibsejournal.com/cpd/modules/2009-06/</a> RH.4       CIBSE (2009). KS14 Energy efficient heating.         Department for Levelling Up, Housing & Communities (2022). Approved Document L, Conservation of fuel and power, Volume 2: Buildings other than dwellings.         District Heating       Department for Levelling Up, Housing & Communities, (2022). Approved Document L, Conservation of fuel and power, Volume 1: Dwellings.         DH.1       Department for Levelling Up, Housing & Communities, (2022). Approved Document L, Conservation of fuel and power, Volume 1: Dwellings.         DH.2       CIBSE, (2020). CP1 Heat networks: Code of Practice for the UK, London.         DH.3       Mayor of London, (2014). London Heat Network Manual.         Future Heating       FH1         Department for Business, Energy, and Industrial Strategy. (2021). Quality Assu ance for Combined Heat and Power – The CHPQA Standard issue 8.         FH.2       CIBSE. (2015). Environmental Design Guide A.         FH.3       IGEM. (2022). Reference Standard for low pressure hydrogen utilisation IGEM/H/1 with amendments June 2022.         Department for Business, Energy, and Industrial Strategy. (2021). Combined Heat and Power – Project development a detailed guide for CHP developers. Parts 1 – 6.         FH.4       Department for Business, Energy, and Industrial Strategy. (2021). Combined Heat and Power – Project development a detailed guide for CHP developers. Parts 1 – 6.         BR	RH.2	CIBSE (2016). Guide B1 Heating.
RH.5       Department for Levelling Up, Housing & Communities (2022). Approved Document L, Conservation of fuel and power, Volume 2: Buildings other than dwellings.         District Heating       Department for Levelling Up, Housing & Communities, (2022). Approved Document L, Conservation of fuel and power, Volume 1: Dwellings.         DH.1       Department for Levelling Up, Housing & Communities, (2022). Approved Document L, Conservation of fuel and power, Volume 1: Dwellings.         DH.2       CIBSE, (2020). CP1 Heat networks: Code of Practice for the UK, London.         DH.3       Mayor of London, (2014). London Heat Network Manual.         Future Heating       Future Heating         FH.1       Department for Business, Energy, and Industrial Strategy. (2021). Quality Assu ance for Combined Heat and Power – The CHPQA Standard issue 8.         FH.2       CIBSE. (2015). Environmental Design Guide A.         FH.3       IGEM. (2022). Reference Standard for low pressure hydrogen utilisation IGEM/H/1 with amendments June 2022.         Department for Business, Energy, and Industrial Strategy. (2021). Combined Heat and Power – Project development a detailed guide for CHP developers. Parts 1 – 6.         FH.4       BRE Trust, (2018). BREEAM New Construction 2018 (UK) [Online] https://files/files/files/files/files/files/files/files/files/files/files/files/files/files/files/files/files/files/files/files/files/files/files/files/files/files/files/files/files/files/files/files/files/files/files/files/files/files/files/files/files/files/files/files/files/files/files/files/files/files/files/files/files/files/files/files/files/files/files/files/files/	RH.3	CIBSE Journal (2009): Module 5: Radiant heating panels. CIBSE Journal. [On- line] CIBSE, [Online] < <u>https://www.cibsejournal.com/cpd/modules/2009-06/&gt;</u> .
RH.5       Document L, Conservation of fuel and power, Volume 2: Buildings other than dwellings.         District Heating       Department for Levelling Up, Housing & Communities, (2022). Approved Document L, Conservation of fuel and power, Volume 1: Dwellings.         DH.1       Department for Levelling Up, Housing & Communities, (2022). Approved Document L, Conservation of fuel and power, Volume 1: Dwellings.         DH.2       CIBSE, (2020). CP1 Heat networks: Code of Practice for the UK, London.         DH.3       Mayor of London, (2014). London Heat Network Manual.         Future Heating       Future Heating         FH.1       Department for Business, Energy, and Industrial Strategy, (2021). Quality Assu ance for Combined Heat and Power – The CHPQA Standard issue 8.         FH.2       CIBSE. (2015). Environmental Design Guide A.         FH.3       IGEM. (2022). Reference Standard for low pressure hydrogen utilisation IGEM/H/1 with amendments June 2022.         Pepartment for Business, Energy, and Industrial Strategy, (2021). Combined Heat and Power – Project development a detailed guide for CHP developers. Parts 1 – 6.         BRE Trust, (2018). BREEAM New Construction 2018 (UK) [Online] https://files/parts 1 – 6.         BRE Trust, (2018). BREEAM New Construction 2018 (UK) [Online] https://files/parts 1 – 6.         BRE Toust, (2013). The Chartered Institution of Building Services Engineers. AM12 Combined heat and power for buildings.         FH.6       CIBSE, (2013). The Chartered Institution of Building Services Engineers. AM12 Combined heat and power f	RH.4	CIBSE (2009). KS14 Energy efficient heating.
DH.1       Department for Levelling Up, Housing & Communities, (2022). Approved Document L, Conservation of fuel and power, Volume 1: Dwellings.         DH.2       CIBSE, (2020). CP1 Heat networks: Code of Practice for the UK, London.         DH.3       Mayor of London, (2014). London Heat Network Manual.         Future Heating       Entry of Combined Heat and Power – The CHPQA Standard issue 8.         FH.1       Department for Business, Energy, and Industrial Strategy. (2021). Quality Assu ance for Combined Heat and Power – The CHPQA Standard issue 8.         FH.2       CIBSE. (2015). Environmental Design Guide A.         FH.3       IGEM. (2022). Reference Standard for low pressure hydrogen utilisation IGEM/H/1 with amendments June 2022.         Department for Business, Energy, and Industrial Strategy. (2021). Combined Heat and Power – Project development a detailed guide for CHP developers. Parts 1 – 6.         FH.4       BRE Trust, (2018). BREEAM New Construction 2018 (UK) [Online] https://files/parts1 – 6.         FH.5       BRE Trust, (2018). BREEAM New Construction 2018 (UK) [Online] https://files/parts1 – 6.         FH.6       CIBSE, (2013). The Chartered Institution of Building Services Engineers. AM12 Combined heat and power for buildings.         FH.6       CIBSE, (2013). The Chartered Institution of Building Services Engineers. AM12 Combined heat and power for buildings.	RH.5	Document L, Conservation of fuel and power, Volume 2: Buildings other than
DH.1       ment L, Conservation of fuel and power, Volume 1: Dwellings.         DH.2       CIBSE, (2020). CP1 Heat networks: Code of Practice for the UK, London.         DH.3       Mayor of London, (2014). London Heat Network Manual.         Future Heating       FH.1         Department for Business, Energy, and Industrial Strategy, (2021). Quality Assu ance for Combined Heat and Power – The CHPQA Standard issue 8.         FH.2       CIBSE. (2015). Environmental Design Guide A.         FH.3       IGEM. (2022). Reference Standard for low pressure hydrogen utilisation IGEM/H/1 with amendments June 2022.         FH.4       Department for Business, Energy, and Industrial Strategy, (2021). Combined Heat and Power – Project development a detailed guide for CHP developers. Parts 1 – 6.         FH.5       BRE Trust, (2018). BREEAM New Construction 2018 (UK) [Online] https://files/parts1 – 6.         FH.6       CIBSE, (2013). The Chartered Institution of Building Services Engineers. AM12 Combined heat and power for buildings.         FH.6       CIBSE, (2013). The Chartered Institution of Building Services Engineers. AM12 Combined heat and power for buildings.	District He	ating
DH.3       Mayor of London, (2014). London Heat Network Manual.         Future Heating         FH.1       Department for Business, Energy, and Industrial Strategy. (2021). Quality Assu ance for Combined Heat and Power – The CHPQA Standard issue 8.         FH.2       CIBSE. (2015). Environmental Design Guide A.         FH.3       IGEM/ (2022). Reference Standard for low pressure hydrogen utilisation IGEM/H/1 with amendments June 2022.         FH.4       Department for Business, Energy, and Industrial Strategy, (2021). Combined Heat and Power – Project development a detailed guide for CHP developers. Parts 1 – 6.         FH.5       BRE Trust, (2018). BREEAM New Construction 2018 (UK) [Online] https://files/bregroup.com/breeam/technicalmanuals/NC2018/#12 pollution/pol02.a. htm%3FTocPath%3D12.0%2520Pollution%7C2"         FH.6       CIBSE, (2013). The Chartered Institution of Building Services Engineers. AM12 Combined heat and power for buildings.         FH.7       Health and Safety Executive, (2009). Installation permitting guidance for hydrocenter and power for buildings.	DH.1	Department for Levelling Up, Housing & Communities, (2022). Approved Document L, Conservation of fuel and power, Volume 1: Dwellings.
Future Heating         FH.1       Department for Business, Energy, and Industrial Strategy. (2021). Quality Assu ance for Combined Heat and Power – The CHPQA Standard issue 8.         FH.2       CIBSE. (2015). Environmental Design Guide A.         FH.3       IGEM. (2022). Reference Standard for low pressure hydrogen utilisation IGEM/H/1 with amendments June 2022.         FH.4       Department for Business, Energy, and Industrial Strategy. (2021). Combined Heat and Power – Project development a detailed guide for CHP developers. Parts 1 – 6.         FH.5       BRE Trust. (2018). BREEAM New Construction 2018 (UK) [Online] https://files bregroup.com/breeam/technicalmanuals/NC2018/#12_pollution/pol02_a. htm%3FTocPath%3D12.0%2520Pollution%7C2"         FH.6       CIBSE, (2013). The Chartered Institution of Building Services Engineers. AM12 Combined heat and power for buildings.         FH.7       Health and Safety Executive, (2009). Installation permitting guidance for hydro	DH.2	CIBSE, (2020). CP1 Heat networks: Code of Practice for the UK, London.
FH.1       Department for Business, Energy, and Industrial Strategy. (2021). Quality Assu ance for Combined Heat and Power – The CHPQA Standard issue 8.         FH.2       CIBSE. (2015). Environmental Design Guide A.         IFH.3       IGEM. (2022). Reference Standard for low pressure hydrogen utilisation IGEM/H/1 with amendments June 2022.         FH.4       Department for Business, Energy, and Industrial Strategy, (2021). Combined Heat and Power – Project development a detailed guide for CHP developers. Parts 1 – 6.         FH.5       BRE Trust, (2018). BREEAM New Construction 2018 (UK) [Online] https://files bregroup.com/breeam/technicalmanuals/NC2018/H12 pollution/pol02 a. htm%3FTocPath%3D12.0%2520Pollution%7C2"         FH.6       CIBSE, (2013). The Chartered Institution of Building Services Engineers. AM12 Combined heat and power for buildings.	DH.3	Mayor of London, (2014). London Heat Network Manual.
FH.1       ance for Combined Heat and Power – The CHPQA Standard issue 8.         FH.2       CIBSE. (2015). Environmental Design Guide A.         FH.3       IGEM/L/1 with amendments June 2022.         FH.4       Department for Business, Energy, and Industrial Strategy, (2021). Combined Heat and Power – Project development a detailed guide for CHP developers. Parts 1 – 6.         FH.5       BRE Trust, (2018). BREEAM New Construction 2018 (UK) [Online] https://files.bregroup.com/breeam/technicalmanuals/NC2018/#12 pollution/pol02.a.         FH.6       CIBSE, (2013). The Chartered Institution of Building Services Engineers. AM12 Combined heat and power for buildings.         FH.7       Health and Safety Executive, (2009). Installation permitting guidance for hydrocement and power for buildings.	Future He	ating
FH.3       IGEM. (2022). Reference Standard for low pressure hydrogen utilisation IGEM/H/1 with amendments June 2022.         FH.4       Department for Business, Energy, and Industrial Strategy, (2021). Combined Heat and Power – Project development a detailed guide for CHP developers. Parts 1 – 6.         FH.5       BRE Trust, (2018). BREEAM New Construction 2018 (UK) [Online] https://files.bregroup.com/breeam/technicalmanuals/NC2018/#12 pollution/pol02_a.htm%3FTocPath%3D12.0%2520Pollution%7C2"         FH.6       CIBSE, (2013). The Chartered Institution of Building Services Engineers. AM12 Combined heat and power for buildings.         FH.7       Health and Safety Executive, (2009). Installation permitting guidance for hydromatical permitting guidance for hydromatical permitting guidance for hydromatical permitting guidance for hydromatical permitting guidance for hydromatical permitting guidance for hydromatical permitting guidance for hydromatical permitting guidance for hydromatical permitting guidance for hydromatical permitting guidance for hydromatical permitting guidance for hydromatical permitting guidance for hydromatical permitting guidance for hydromatical permitting guidance for hydromatical permitting guidance for hydromatical permitting guidance for hydromatical permitting guidance for hydromatical permitting guidance for hydromatical permitting guidance for hydromatical permitting guidance for hydromatical permitting guidance for hydromatical permitting guidance for hydromatical permitting guidance for hydromatical permitting guidance for hydromatical permitting guidance for hydromatical permitting guidance for hydromatical permitting guidance for hydromatical permitting for hydromatical permitting guidance for hydromatical permitting guidance for hydromatical permitting guidance for hydromatical permitting for hydro	FH.1	Department for Business, Energy, and Industrial Strategy. (2021). Quality Assur- ance for Combined Heat and Power – The CHPQA Standard issue 8.
FH.3       IGEM/H/1 with amendments June 2022.         FH.4       Department for Business, Energy, and Industrial Strategy, (2021). Combined Heat and Power – Project development a detailed guide for CHP developers. Parts 1 – 6.         FH.5       BRE Trust, (2018). BREEAM New Construction 2018 (UK) [Online] https://files bregroup.com/breeam/technicalmanuals/NC2018/#12 pollution/pol02 a. htm%3FTocPath%3D12.0%2520Pollution%7C 2"         FH.6       CIBSE, (2013). The Chartered Institution of Building Services Engineers. AM12 Combined heat and power for buildings.         FH.7       Health and Safety Executive, (2009). Installation permitting guidance for hydro	FH.2	CIBSE. (2015). Environmental Design Guide A.
FH.4       Heat and Power – Project development a detailed guide for CHP developers. Parts 1 – 6.         FH.5       BRE Trust, (2018). BREEAM New Construction 2018 (UK) [Online] https://files bregroup.com/breeam/technicalmanuals/NC2018/#12 pollution/pol02 a. htm%3FTocPath%3D12.0%2520Pollution%7C 2"         FH.6       CIBSE, (2013). The Chartered Institution of Building Services Engineers. AM12 Combined heat and power for buildings.         FH.7       Health and Safety Executive, (2009). Installation permitting guidance for hydro	FH.3	
FH.5         bregroup.com/breeam/technicalmanuals/NC2018/#12 pollution/pol02 a. htm%3FTocPath%3D12.0%2520Pollution%7C 2"           FH.6         CIBSE, (2013). The Chartered Institution of Building Services Engineers. AM12 Combined heat and power for buildings.           FH.7         Health and Safety Executive, (2009). Installation permitting guidance for hydrometry for the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service of the service	FH.4	Heat and Power – Project development a detailed guide for CHP developers.
<ul> <li>Combined heat and power for buildings.</li> <li>Health and Safety Executive, (2009). Installation permitting guidance for hydrometry (2009).</li> </ul>	FH.5	BRE Trust, (2018). BREEAM New Construction 2018 (UK) [Online] <u>https://files.bregroup.com/breeam/technicalmanuals/NC2018/#12 pollution/pol02 a.htm%3FTocPath%3D12.0%2520Pollution%7C_2"</u>
	FH.6	CIBSE, (2013). The Chartered Institution of Building Services Engineers. AM12: Combined heat and power for buildings.
gen and fuel cell stationary applications: UK version.	FH.7	Health and Safety Executive, (2009). Installation permitting guidance for hydro- gen and fuel cell stationary applications: UK version.
FH.8 BSI PAS 4444:2020+A1: 2021. Hydrogen-fired gas appliances.	FH.8	BSI PAS 4444:2020+A1: 2021. Hydrogen-fired gas appliances.
<b>FH.9</b> BEIS (2022) UK Low Carbon Hydrogen Standard Guidance on the greenhous gas emissions and sustainability criteria	FH.9	BEIS (2022) UK Low Carbon Hydrogen Standard Guidance on the greenhouse gas emissions and sustainability criteria

FH.10	BS ISO 22734: 2019. Hydrogen generators using water electrolysis — Industrial, commercial, and residential applications.
FH.11	BSRIA, (2007). BG2 - CHP for existing buildings Guidance on design and installation.
FH.12	BSI PAS 67: (2008). Laboratory tests to determine the heating and electrical performance of heat-led micro-cogeneration packages primarily intended for heating dwellings.
FH.13	Ministry of Housing, Communities & Local Government, (2021). National Calcu- lation Methodology (NCM) modelling guide.
FH.14	Energy Networks Association
Domestic	Hot Water
Centralise	d System
CHW.1	CIBSE. (2013). TM13 Minimising the risk of Legionnaires disease.
CHW.2	CIBSE. (2020). CP1 Heat networks: Code of Practice for the UK.
CHW.3	Department for Levelling Up, Housing & Communities (2016). Approved Document G - Sanitation, hot water safety and water efficiency (2015 edition with 2016 amendments).
CHW.4	British Standards Institute. BS 6700: 2006 Design, installation, testing and maintenance of services supplying water for domestic use within buildings and their curtilages - Specification (+A1:2009).
CHW.5	Department for Levelling Up, Housing & Communities, (2022). Approved Docu- ment L, Conservation of fuel and power, Volume 1: Dwellings.
CHW.6	Department for Levelling Up, Housing & Communities, (2022). Approved Document L, Conservation of fuel and power, Volume 2: Buildings other than dwellings.
CHW.7	Health and Safety Executive. (2013). Legionnaires' disease. The control of legionella bacteria in water systems.
CHW.8	BS EN 89:2000 Gas-fired storage water heaters for the production of domestic hot water (AMD 12049) (AMD 16768) (Withdrawn)
CHW.9	BS EN 89:2015 Gas-fired storage water heaters for the production of domestic hot water
CHW.10	BS EN 26:1998 Gas-fired instantaneous water heaters for the production of domestic hot water, fitted with atmospheric burners (AMD 12083) (AMD 15304) (AMD 16769) (Withdrawn)
CHW.11	BS EN 26:2015 Gas-fired instantaneous water heaters for the production of domestic hot water
CHW.12	Commission Regulation (EU) No 814/2013 Annex III: Measurements

Point of Us	66
POU.1	CIBSE. (2014). Guide G Public health and plumbing engineering.
POU.2	HM Government. (2013). Non-Domestic Building Services Compliance Guide.
POU.3	Department for Levelling Up, Housing & Communities, (2022). Approved Docu- ment L, Conservation of fuel and power, Volume 1: Dwellings.
POU.4	BRE. (2003). IP 14/03 Preventing hot water scalding in bathrooms: using TMVs [Document] Bracknell: BRE.
POU.5	Department for Levelling Up, Housing & Communities, (2016). Approved Document G - Sanitation, hot water safety and water efficiency (2015 edition with 2016 amendments).
POU.6	British Standards Institution: BS EN 60335-2-35:2002 Household and similar electrical appliances - Safety. Particular requirements for instantaneous water heaters (+A2:2011) (incorporating corrigendum December 2005 and April 2007).
Solar Hot	Water
SHW.1	Department for Levelling Up, Housing & Communities, (2022). Approved Docu- ment L, Conservation of fuel and power, Volume 1: Dwellings.
SHW.2	Energy Saving Trust. (2019). Solar water heating system - guidance for professionals, conventional indirect models. [Document].
SHW.3	Novo Design. (2021). Your Guide to Solar Thermal. Novo Design. [Online] February 2021. [Cited: September 28, 2022.] <u>https://www.novo-design.co.uk/</u> your-guide-to-solar-thermal-systems.
SHW.4	Greater London Authority. (2018). Solar Action Plan for London. London.
SHW.5	Department for Business, Energy and Industrial Strategy. (2019). Energy Tech- nology Criteria List. London.
SHW.6	British Standards Institution. BS EN 12975: 2022. Solar collectors. General requirements. London.
SHW.7	British Standards Institution. BS EN 12976-1: 2021. Thermal solar systems and components - factory made systems. General requirements. London.
SHW.8	BS EN ISO 9806:2017 Solar energy - solar thermal collectors - test methods (ISO 9806:2017)

Cooling	
C.1	Department for Levelling Up, Housing & Communities, (2022). Approved Document L, Conservation of fuel and power, Volume 2: Buildings other than dwellings.
C.2	Standard, British, (2018). BS EN 14511-2: 2018. Air conditioners, liquid chilling packages and heat pumps for space heating and cooling and process chillers, with electrically driven compressors Test conditions. British Standards.
C.3	Ministry of Defence. Ministry of Defence JSP 850.
C. 4	BREEAM. (2018). BREEAM New Construction 2018 (UK). BREEAM.
C.5	Directive 2009/125/EC of the European Parliament and of the Council, (2009).
C. 6	Directive 2014/30/EU of the European Parliament and of the Council, (2014).
C.7	BSRIA, (2011). Rule of Thumb: BSRIA, 2011. BG 9 / 2011.
C.8	European Standards, (2020). BS EN 378-3:2016+A1:2020 Refrigerating systems and heat pumps. Safety and environmental requirements Installation site and personal protection.
C.9	CIBSE, (2016). "Guide B," London.
C.10	BRE Trust, (2009). Energy Management in the Built Environment - Review of Best Practice. BRE Trust.
C.11	BCO Guide to Specification, (2009). Cooling Section.
C.12	Department for Levelling Up, Housing & Communities, (2022). Approved Document O, Building regulation in England setting standards for overheating in new residential buildings.
C.13	SFG20: Software.
C.14	CIBSE, (2014). Guide M Maintenance engineering and management, London.
C.15	Microgeneration Certification Scheme, (2018). MCS 007: Product Certification Scheme Requirements – Heat Pumps.
C.16	BRE Trust (2013). BREEAM, "Pol 01 - Impact of Refrigerants," BREEAM, 2013. [Online]. Available: https://kbbreeam.com/wp-content/plugins/breeamkb-pdf/ pdf/?c=266. [Accessed 02 08 2022].
C.17	CIBSE, (2016). Guide C, London.
C.18	CIBSE, (2015). Guide A: Environmental Design, London.
C.19	BSRIA. (2010). BSRIA, 2010. BG 1/2010.
C.20	Standard, British. (2018). BS EN 14511-2: 2018. Air conditioners, liquid chilling packages and heat pumps for space heating and cooling and process chillers, with electrically driven compressors Test conditions. British Standards.
C.21	BSRIA: BSRIA, (2011). BG41/2011.

BS EN 1264-4: 2021. Water based surface embedded heating and cooling systems Installation.
BS 4485-2: Water cooling towers. (1988). Methods for performance testing.
Notification of Cooling Towers and Evaporative Condensers Regulations 1992 (SI 1992/2225).
BSRIA, (2011). Rule of Thumb. BSRIA, 2011. BG 9 / 2011.
BSRIA, (2009). Model Commissioning. BSRIA, 2009. BG 8 / 2009.
Health and Safety Executive. (2013). HSG274. Part 1 Legionnaires' disease: The control of Legionella bacteria.
CIBSE, (2013). TM13 Minimising the risk of Legionnaires disease.
Health and Safety Executive. (2013). Legionnaires' disease. The control of legionella bacteria in water systems.
CIBSE, (2009). Guide H: Building Control Systems, London.
The European Commission, (2012). Commission Regulation (EU) No 206/2012, Official Journal of the European Union.
BEIS. (2021). Energy Technology Criteria List. BEIS.
Building Regulations. Approved Document Part L. 2021.
BSI. BS 1566-1:2002+A1: 2011. Copper indirect cylinders for domestic pur- poses - Open vented copper cylinders. Requirements and test methods. BSI Knowledge, 2002.
European Standards. BS EN 60379: 2004. Methods for measuring the perfor- mance of electric storage water-heaters for household purposes.
BS EN 14705:2005
Heat exchangers. Method of measurement and evaluation of thermal perfor- mances of wet cooling towers
Eurovent 9/12 (2016). Performance Efficiency Standard for Evaporative Cooling Equipment.

Ventilatio	n
General	
V.1	BS EN 13779:2007 Ventilation for non-residential buildings - Performance requirements for ventilation and room-conditioning systems (incorporating corrigendum May 2014) (Withdrawn)
V.2	BS EN 15232:2012 Energy performance of buildings - Impact of building auto- mation, controls and building management
Air Handlin	g/ Mechanical Ventilation
AHU.1	British Standards Institute, (2017). BS EN 16798-3: 2017. Energy performance of buildings - ventilation for buildings.
AHU.2	British Standards Institute, (2019). BS EN 13053: 2019. Ventilation for buildings. Air handling units. Rating and performance for units, components and sections.
AHU.3	British Standards Institute, (2007). BS EN 1886: 2007. Ventilation for buildings - Air handling units - Mechanical Performance.
AHU.4	British Standards Institute, (2011). BS EN 15780: 2011. Ventilation for buildings - Ductwork - Cleanliness of ventilation systems.
AHU.5	BSRIA, (2011). Rule of Thumb: Guidelines for building services (5th Edition).
AHU.6	Department for Levelling Up, Housing & Communities, (2022). Approved Document L, Conservation of fuel and power, Volume 1: Dwellings.
AHU.7	HM Government, (2013). Non-Domestic Building Services Compliance Guide.
AHU.8	CIBSE, (2013). TM13 Minimising the risk of Legionnaires disease,
AHU.9	Health and Safety Executive, (2013). Legionnaires' disease. The control of legionella bacteria in water systems.
AHU.10	Institute of Air Quality Management, (2021). Indoor Air Quality Guidance: Assessment, Monitoring, Modelling and Mitigation: Version 1.
Extract On	y Fans
EOF.1	CIBSE, (2016). Guide B2: Ventilation and Ductwork, London.
EOF.2	Department for Levelling Up, Housing and Communities and Ministry of Hous- ing, Communities & Local Government. (2022). Combustion appliances and fuel storage systems: Approved Document J.
EOF.3	BSRIA. (2013). BG 43/2013 Flexible ductwork: a guide to specification, pro- curement, installation and maintenance.
EOF.4	Department for Levelling Up, Housing and Communities and Ministry of Housing, Communities & Local Government. (2022). Ventilation: Approved Document F.
EOF.5	BSRIA. (2009). The Illustrated Guide to Ventilation.

EOF.6	CIBSE. (2005). AM10: Natural ventilation in non-domestic buildings. London : CIBSE Publications.
EOF.7	NHBC. 8.3 Mechanical ventilation with heat recovery: 8.3.5 Design Con- siderations, 2022 [Online]. Available: <u>https://nhbc-standards.co.uk/8-ser-</u> vices/8-3-mechanical-ventilation-with-heat-recovery/8-3-5-design-consid- <u>erations/</u>
EOF.8	Ministry of Housing, Communities & Local Government. (2015). Approved Document E: resistance to the passage of sound.
EOF.9	Passivhaus Trust. (2018). Good Practice Guide - MVHR for single dwelling.
Heat Recov	ery
HR.1	Passivhaus Trust. (2018) Good Practice Guide - MVHR for single dwelling.
HR.2	Department for Levelling Up, Housing and Communities and Ministry of Housing, Communities & Local Government. (2022) Ventilation: Approved Document F.
HR.3	Module 141: MVHR for energy-efficient ventilation and summer cooling. CIBSE Journal. s.l. : CIBSE, 2019, Vol. 141.
HR.4	British Standard Institute. BS EN 13053:2019 Ventilation for buildings - air han- dling units - rating and performance for units, components and sections.
HR.5	CIBSE, (2016) Guide B2: Ventilation and Ductwork," London.
HR.6	EcoFlow Ventilation Ltd. (2014). How does MVHR comply with building regula- tions UK?. [Online]. Available: <u>http://www.ecoflowventilation.co.uk/mvhr-com- ply-building-regulations-uk/</u>
HR.7	Ministry of Housing, Communities & Local Government. (2015) Approved Document E: resistance to the passage of sound.
HR.8	BS EN 308:1997 Heat exchangers - test procedures for establishing the perfor- mance of air to air and flue gases heat recovery devices (Withdrawn)
HR.9	BS EN 13053:2006 Ventilation for buildings - Air handling units - Ratings and performance for units, components and sections (+A1:2011)
Ground-Air	Heat Exchanger
GAHE.1	Design Buildings. (2021). Earth to air heat exchangers. Design Buildings. [On- line] Sep 02, 2021. [Cited: Nov 11, 2022.] https://www.designingbuildings.co.uk/ wiki/Earth_to_air_heat_exchangers.
GAHE.2	CanmetENERGY. (2021). Earth to Air Thermal Exchanger (EATEX).
GAHE.3	REHAU. Ground-Air Heat Exchanger FAQs. REHAU. [Online] 2022. [Cited: November 14, 2022.] https://www.rehau.com/uk-en/frequently-asked-ques- tions-earth-tubes#.::text=What%20is%20a%20Ground%2Dair.constant%20 8%2D12%C2%B0C

#### Dehumidification British Standards Institute, (2021). BS 5250: 2021. Management of moisture in DEH.1 buildings-Code of practice. DEH.2 CIBSE, (2020). TM40 - Health and wellbeing in building services. CIBSE. DEH.3 BS EN 810:1997 Dehumidifiers with electrically driven compressors - Rating tests, marking, operational requirements and technical data sheet Electric Power Power factor correction BS EN 60831-1:2014 Shunt power capacitors of the self-healing type for a.c. systems having a rated voltage up to and including 1000 V. General - Perfor-PF.1 mance, testing and rating - Safety requirements - Guide for installation and operation (incorporating corrigendum May 2014) PF.2 BS EN 60529:1992+A2:2013 PF.3 Degrees of protection provided by enclosures (IP Code) **EV** Charging Department for Levelling Up, Housing and Communities. (2021). Infrastructure for charging electric vehicles: Approved Document S. EV.1 EV.2 Energy Saving Trust (2020). Electric Vehicle Infrastructure Forecasts 2025. Energy Saving Trust. EV.3 City of London Corporation. (2019). City Streets, Transport for a changing Square Mile. EV.4 Mayor of London. (2021). The London Plan. Internal lighting and controls IL.1 Department for Levelling Up, Housing & Communities, (2022). Approved Document L, Conservation of fuel and power, Volume 1: Dwellings. IL.2 Department for Levelling Up, Housing & Communities, (2022). Approved Document L, Conservation of fuel and power, Volume 2: Non-Dwellings. CIBSE, (2018). SLL Lighting Handbook. IL.3 IL.4 Illuminating Engineering Society, (2019). IES LM-80 Approved Method: Measuring Luminous flux and colour maintenance of LED packages, arrays and modules. IES. International Electrotechnical Commission, (2019). Digital Addressable Light-IL.5 ing Interface (DALI). The Ecodesign for Energy-Related Products and Energy Information (Lighting Products) Regulations 2021, No. 1095. IL.6

IL.7	British Standards Institute, (2021). BS 5250: 2021. Management of moisture in buildings – Code of practice.
IL.8	CIBSE, (2020). TM40 - Health and wellbeing in building services. CIBSE.
IL.9	BS EN 810:1997 Dehumidifiers with electrically driven compressors - Rating tests, marking, operational requirements and technical data sheet
IL.10	BS EN IEC 61439-1:2021 Low-voltage switchgear and controlgear assemblies General rules
External ligh	ting and controls
EL.1	BRE, (2016). BREEAM International New Construction. 2016.
EL.2	Illumination Engineering Society, (2015). TM-30-15. 2015.
EL.3	City of London Corporation, (2018). Light and Darkness in the City - A lighting vision for the City of London.
EL.4	Illuminating Engineering Society, (2019). IES LM-80 Approved Method: Measuring Luminous flux and colour maintenance of LED packages, arrays and modules. IES.
EL.5	City of London Corporation, (2020). Housing Design Guide.
EL.6	City of London Corporation, (2019). City Streets, Transport for a changing Square Mile.
EL.7	CIBSE, (2018). SLL Lighting Handbook.
EL.8	British Standards Institution, (2019). BS EN 15804: 2012+A2: 2019: Sustainabil- ity of construction works - Environmental product declarations - Core rules for the product category of construction products.
Controls	
BMS	
BMS.1	Department for Business, Energy and Industrial Strategy. (2019). Energy Technology Criteria List. London.
BMS.2	BREEAM. (2018). BREEAM New Construction 2018 (UK). BREEAM.
BMS.3	Nabers
BMS.4	ISA/IEC 62443 Series of Standards
BMS.5	BS EN 15500-1:2017 Energy performance of buildings - control for heating, ventilating, and air conditioning applications. Electronic individual zone control equipment - modules M3-5, M4-5, M5-5
BMS.6	BS EN 15232 Energy performance of buildings: impact of building automation, controls and building management

BMS.7	The Electromagnetic Compatibility Regulations 2016
BMS.8	BS EN 62053-21:2003 Electricity metering equipment (a.c) - particular require- ments. Static meters for active energy (classes 1 and 2) (+A1:2017) (Incorporat- ing corrigenda February 2004 and July 2018) (Withdrawn)
BMS.9	BS 8431:2010 Electrical static meters for secondary metering and sub-metering. Specification
BMS.10	BS EN 12261:2002 Gas meters - Turbine gas meters (incorporating corrigen- dum No1 and amendment No1) (Withdrawn)
BMS.11	BS EN 12480:2015 Gas meters - rotary displacement gas meters
BMS.12	BS EN 1359:1999 Gas meters. Diaphragm gas meters (+ AMD 16457) (With- drawn)
BMS.13	City of London (2022), Building Energy Management System Standardisation Specification, Version 1.4
Renewab	les
Solar PV	
PV.1	EN 15316-4-3: 2017. Energy performance of buildings - Method for calculation of system energy requirements and system efficiencies - Part 4-3: Heat genera tion systems, thermal solar and photovoltaic systems.
PV.2	IEC, (2017). Electrical energy storage (EES) systems - Part 2-1: Unit parameters and testing methods - General specification.
PV.3	The Ecodesign for Energy-Related Products and Energy Information (Lighting Products) Regulations 2021 No. 1095.
PV.4	BloombergNEF (2020). BloombergNEF PV Module Tier 1 List Methodology.
Battery Stor	age
BT.1	IEC 62933 (2018) -Electrical energy storage (EES) systems
BT.2	IET CoP for Electrical Energy Storage Systems; 2020 2nd edition
BT.3	PD IEC/TS 62933-4-1:2017 Electrical energy storage (EES) systems Guidance on environmental issues. General specification
BT.4	(BS EN IEC 62933-4-2 EES Systems Standard)

Compon	ents
General	
CP.1	ISO 13857:2019
	Safety of machinery — Safety distances to prevent hazard zones being reached by upper and lower limbs
CP.2	BS EN ISO 13854:2019, 'Safety of machinery. Minimum gaps to avoid crushing of parts of the human body.'
CP.3	BS EN ISO 809: Establishes safety requirements relating to the construction, assembly, erection, operation and servicing of rotodynamic, rotary positive displacement and reciprocating displacement pumps and pump units.
CP.4	BS EN 13779:2007 Ventilation for non-residential buildings - Performance requirements for ventilation and room-conditioning systems (incorporating corrigendum May 2014) (Withdrawn)
Pumps	
PUM.1	Module 145: Resilient and efficient parallel pump systems with controlled redun- dancy. CIBSE journal. London, CIBSE, 2019.
PUM.2	CIBSE. Guide G: Public health and plumbing engineering. CIBSE, 2014.
PUM.3	OfWat. The guaranteed standards scheme (GSS): summary of standards and conditions. 2017.
PUM.4	BSRIA, (2002). Key Skills Variable Temperature Flow Systems.
Fans	
FAN.1	European Commission. (2009). Directive 2009/125/EC of the European Parliament and of the Council.
FAN.2	European Commission. (2011). Directive 327/2011 of the European Parliament and of the Council.
FAN.3	Department for Levelling Up, Housing and Communities and Ministry of Housing, Communities & Local Government. (2022). Ventilation: Approved Document F.
FAN.4	Department for Levelling Up, Housing & Communities, (2022). Approved Document L, Conservation of fuel and power, Volume 1: Dwellings.
FAN.5	British Standards Institution. (2017). BS EN ISO 5801: 2017 Edition, Fans - Per- formance testing using standardized airways.
FAN.6	British Standards Institution. (2014). BS EN ISO 8233, Guidance on sound insulation and noise reduction for buildings.

Refrigerant	
REF.1	European Standards, (2020). BS EN 378-3:2016+A1:2020 Refrigerating systems and heat pumps. Safety and environmental requirements Installation site and personal protection.
REF.2	Institute of Refrigeration. (2013). Safety code of practice for refrigerating systems utilising carbon dioxide refrigerant. Carshalton.
REF.3	Institute of Refrigeration. (2013). Safety code of practice - ammonia refrigeran Carshalton.
REF.4	BRE Trust, (2013). BREEAM, Pol 01 - Impact of Refrigerants. [Online]. Available https://kb.breeam.com/wp-content/plugins/breeamkb-pdf/pdf/?c=266. [Accessed 02 08 2022].
REF.5	International Organization for Standardization. (2014). ISO 817:2014 - Refriger ants — Designation and safety classification.
Water Qual	ity
WQ.1	BS EN 806 (2012) Specifications for installations inside buildings conveying water for human consumption
WQ.2	BSRIA BG 50/2013: Water treatment of Closed Heating and Cooling System
WQ.3	BSRIA BG 29/2020: Pre-Commission Cleaning of Pipework Systems
WQ.4	DI 2035 Part 1: Prevention of damage in water heating installations. Scale form tion in domestic hot water supply installations and water heating installations
WQ.5	Water quality assessment in UK district heating systems (Greaves, 2019)
WQ.6	Water Treatment and Corrosion Prevention: Recommendations (Danish District Heating Association, 2015)
WQ.7	The Water Supply (Water Quality) Regulations 2018

### GLOSSARY

- Advisory Professional (AP) a role demonstrating specialist skills in sustainability and environmental design combined with a high level of competence in the assessment process.
- Air Handling Unit (AHU) Air handling units' condition and distribute air within a building. They take fresh ambient air from outside, clean it, heat it or cool it
- Ambient Temperature Loop district heating scheme (ATL)
- Air Source Heat Pump (ASHP) a type of heat pump that can absorb heat from outside a structure and release it inside using the same vapor-compression refrigeration process and much the same equipment as air conditioners but used in the opposite direction
- Best Available Technology (BAT) Guidance in the Technology Guide on actions and studies to be undertaken across the RIBA stages to provide evidence the best available technology is chosen, evidence is provided on its implementation and monitoring is undertaken

- Branch Controller Boxes Controller within a VRF system which intelligently transfers energy around the system, drawing on energy from the heat source / outdoor units. It directs energy as requested by the individual indoor units
- Building and Energy Management System (BEMS) – is a computer-based system designed to help to monitor, control, measure, and optimize energy consumption needs of a building
- Building Information Modelling (BIM) a process for creating and managing digital information throughout the lifetime of a building
- Building Management SysteQm (BMS) a computer-based system installed in buildings to manage and monitor equipment such as airconditioning, heating, ventilation, lighting, power systems, security devices, IoT sensors, energy, and gas meters
- Building Performance Evaluation (BPE) an evaluation of the performance of different components and aspects of a building, including building fabric building services and controls strategies energy, fuel and water use handover and commissioning processes occupant satisfaction occupant comfort

- Building Regulations Approved Documents reports compiled by Government to provide guidance for how each 'Part' of the Building Regulations can be complied with when undertaking building work (including plumbing, electrics, extensions, etc.).
- Building Regulations UK Part L (BRUKL) a UK building regulation issued by the Secretary of State which lays down specific measures for the conservation of fuel and power. Part L aims to make buildings as energy efficient as possible and therefore efficient electric lighting is required in most buildings.
- Building Research Establishment Environmental Assessment Method (BREEAM) – an assessment undertaken by independent licensed assessors using scientifically-based sustainability metrics and indices which cover a range of environmental issues
- CE Marking certifies the manufacturer or importer affirms the good's conformity with European health, safety, and environmental protection standards.

- Chartered Institute of Building Services Engineers Guides (CIBSE) – an international professional engineering that represents building services engineers
- Chilled Water Systems (CHW) cooling systems that circulate chilled water throughout a building for cooling and dehumidifying a building's air
- Climate Adaptation the process of adjusting to current or expected effects of climate change
- Coefficient of Performance (COP) a ratio of useful heating or cooling provided to work (energy) required a heat pump, refrigerator or air conditioning system
- Combined Heat and Power (CHP) the simultaneous generation of heat and power in a single process and provides one of the most cost-effective methods for reducing carbon emissions
- Combined Heat and Power Quality Assurance (CHPQA) – the Government initiative that provides a practical approach to assessing all types and sizes of CHP schemes in the UK.

- Compulsory Purchase Order (CPO) a legal function in the United Kingdom and Ireland that allows certain bodies to obtain land or property without the consent of the owner.
- Computational Fluid Dynamic (CFD) a branch of fluid mechanics that uses numerical analysis and data structures to analyse and solve problems that involve fluid flows.
- Control of Substances Hazardous to Health Regulations (COSHH) – statutory instrument which states general requirements imposed on employers to protect employees and others from the hazards of substances used at work by risk assessment, control of exposure, health surveillance and incident planning.
- Cooling Technology Institute (CTI) -
- Department for Environment, Food and Rural Affairs (DEFRA) – a department responsible for environmental protection, food production and standards, agriculture, fisheries, and rural communities in the United Kingdom.
- Domestic Hot Water (DHW) the heated potable water that feeds taps, showers, baths, or the kitchen hot taps

- Direct Effect Life CO₂ equivalent emissions (DELC) (air cool chillers Future Proofing)
- DX Units are complete systems, which are not reliant on other sets of equipment like cooling towers and condenser water pumps
- Electric Vehicle (EV) a vehicle that uses one or more electric motors for driving
- Electricity at Work Regulations guidelines to prevent death or personal injury to any person from electrical causes in connection with work activities
- Electromagnetic Compatibility (EMC) is the ability of electrical equipment and systems to function acceptably in their electromagnetic environment, by limiting the unintentional generation, propagation and reception of electromagnetic energy which may cause unwanted effects
- Electronically Commutated Motors (ECM) is a synchronous motor using a direct current electric power supply. It uses an electronic controller to switch DC currents to the motor windings producing magnetic fields which effectively rotate in space and which the permanent magnet rotor follows

- Energy Performance Certificate (EPC) a rating scheme to summarise the energy efficiency of buildings. The building is given a rating between A (Very efficient) - G (Inefficient).
- Energy Use Intensity (EUI) a measure of the energy inefficiency of an economy. It is calculated as units of energy per unit of GDP.
- Environmental Impact Assessment (EIA) a report which estimates the effects of a proposed development or construction project. It provides a technical evaluation that are intended to contribute to more objective decision making.
- Fan Terminal Units (FTU) a type of terminal unit that uses a fan to provide air movement.
- Variable Air Volume (VAV) is a type of heating, ventilating, and/or air-conditioning system. The system varies the airflow at a constant or varying temperature.
- Fan Coil Unit (FCU) often connected to ductwork and a thermostat to regulate the temperature of one or more spaces as well as assisting the main air handling unit for each space if used with chillers.

- Ground Air Heat Exchanger (GAHE) offer an innovative method of heating and cooling a building and are often used on zero carbon/ Passivhaus buildings. Ventilation air is drawn through underground pups which pre-heats the air.
- Gateway
- Global Warming Potential (GWP) is the heat absorbed by any greenhouse gas in the atmosphere, as a multiple of the heat that would be absorbed by the same mass of carbon dioxide (CO₂).
- Gross Internal Area (GIA) the area of a building measured to the internal face of the perimeter walls at each floor level.
- Ground Source Heat Pump (GSHP) a heating/ cooling system for buildings that uses a type of heat pump to transfer heat to or from the ground
- Health and Safety at Work Act defines the fundamental structure and authority for the encouragement, regulation and enforcement of workplace health, safety and welfare within the United Kingdom.

- Heat Pumps a device that can heat a building by transferring thermal energy from the outside using the refrigeration cycle.
- Heating, Ventilation and Air Conditioning (HVAC)

   is the use of various technologies to control the temperature, humidity, and purity of the air in an enclosed space
- High Efficiency Particulate Air (HEPA) a type of pleated mechanical air filter
- Home Quality Mark (HQM) a national standard for new homes, which uses a simple 5-star rating to provide impartial information from independent experts on a new home's design, construction quality and running costs.
- Hydrochlorofluorocarbons (HCFCs) are manmade organic compounds that contain fluorine and hydrogen atoms and are the most common type of organofluoride compounds.
- Indoor Air Quality (IAQ) the air quality within and around buildings and structures.
- International Organization for Standardisation (ISO) – an international standard composed of representatives from the national standards organizations of member countries.

- IWI (Internal solid wall insulation Tech Standard).
- Land Use and Ecology (LE) is one of nine categories and accounts for 10% of the total credits in BREEAM assessments.
- Leadership in Energy and Environmental Design (LEED) – a green building certification program. It includes a set of rating systems for the design, construction, operation, and maintenance of green buildings, homes, and neighbourhoods, which aims to help building owners and operators be environmentally responsible and use resources efficiently.
- Legionella bacteria a genus of pathogenic gram-negative bacteria that includes the species L. pneumophila, causing legionellosis; including a pneumonia-type illness called Legionnaires' disease and a mild flu-like illness called Pontiac fever.
- Life-Cycle Assessment (LCA) a methodology for assessing environmental impacts associated with all the stages of the life cycle of a commercial product, process, or service.

- London Energy Transformation Initiative (LETI)

   a network of over 1,000 built environment
   professionals working together to put London
   on the path to a zero-carbon future.
- Low Temperature Hot Water Heating (LTHW) -
- Management of Health and Safety at Work Regulations 1999 – the regulation which places a duty on employers to assess and manage risks to their employees and others arising from work activities
- Mechanical Ventilation with Heat Recovery (MVHR) – a whole house ventilation system that both supplies and extracts air throughout a property.
- Monitoring Certification Scheme (MCERTS) –
- National Australian Build Environment Rating System (NABERS) – is an initiative by the government of Australia to measure and compare the environmental performance of Australian buildings and tenancies
- Net Zero achieving a balance between the carbon emitted into the atmosphere, and the carbon removed from it.

- Occupational Safety and Health Administration (OSHA) – to assure safe and healthy working conditions for employees by setting and enforcing standards and by providing training, outreach, education, and assistance
- Ozone Depleting Potential (ODP) is the relative amount of degradation a chemical compound can cause to the ozone layer
- Particulate Matter (PM10) a microscopic particles of solid or liquid matter suspended in the air with a diameter of 10 micrometers (µm) or less.
- Particulate Matter (PM2.5) a microscopic particles of solid or liquid matter suspended in the air with a diameter of 2.5 micrometers (µm) or less.
- Passivhaus is a voluntary standard for energy efficiency in a building, which reduces the building's ecological footprint.
- Performance Standard Provides guidance on the minimum threshold performance and higher performance requirements recommended for technologies contained in the Technology Guide to support the deliver of net zero projects.

- Photovoltaics (PV) the conversion of light into electricity using semiconducting materials that exhibit the photovoltaic effect.
- Point of Use Heaters (POU)
- Post Occupancy Evaluation (POE) – is the process of obtaining feedback on a building's performance in use
- Polyvinyl chloride (PVC) a tough chemically resistant synthetic resin used for a wide variety of products
- Royal Institute of British Architects (RIBA) ¬– is a professional body for architects in the United Kingdom.
- Royal Institute of Chartered Surveyors (RICS)

   a global professional body for surveyors. It works at a cross-governmental level. It aims to promote and enforce the highest international standards in the valuation, management and development of land, real estate, construction, and infrastructure.
- Seasonal Energy Efficiency Ratio (SEER) is a rating of a unit which identifies the cooling output during a typical cooling-season divided by the total electric energy input during the same period

- SIP (roof insulation Tech Standard)
- Solar Assisted Heat Pumps (SAHP) a machine that represents the integration of a heat pump and thermal solar panels in a single integrated system.
- Specific Fan Powers (SFP) parameter that quantifies the energy-efficiency of fan air movement systems. It is a measure of the electric power that is needed to drive a fan (or collection of fans), relative to the amount of air that is circulated through the fan
- Suitably Qualified Ecologist (SQE) are ecologist who are full members of the Chartered Institute of Ecology and Environmental Management.
- Technology Guide The Technology Guide is divided into ten main Technology Categories Each sub-category is divided into a Performance Standard and a Technical Standard.
- Technology Standard The Technical Standards provide guidance on the application of the technology or component within the project

- The Construction, Design and Management Regulations 2007 – key piece of health and safety legislation affecting construction and engineering projects and property development.
- Total Equivalent Warming Impact (TEWI) a measure of the combined global warming impacts of the refrigerant losses to the atmosphere and the CO 2 emissions from fossil fuels to generate power to run the refrigeration and air-conditioning systems.
- Total Volatile Solids (TVOC) materials that are completely volatilized from water at higher temperature
- UK Green Building Council (UKGBC) a United Kingdom membership organisation, which aims to 'radically transform' the way that the built environment in the UK is planned, designed, constructed, maintained, and operated.
- US Green Building Council (USGBC) a private, membership-based non-profit organization that promotes sustainability in building design, construction, and operation

- Variable Frequency Drive (VFD) a type of motor drive used in electro-mechanical drive systems to control AC motor speed and torque by varying motor input frequency and, depending on topology, to control associated voltage or current variation
- Volatile Organic Solvents (VOCs) are organic chemicals that have a high evaporation rate at room temperature
- Variable Refrigerant Flow (VRF) also known as variable refrigerant volume (VRV), uses refrigerant as the cooling and heating medium. This refrigerant is conditioned by one or more condensing units (which may be outdoors or indoors, water or air cooled), and is circulated within the building to multiple indoor units
- WELL Building Standard (WELL) aims to encourage the creation of spaces that enhance health and well-being
- World Health Organisation (WHO)– is a specialized agency of the United Nations responsible for international public health.

## // Building Blocks for Net Zero

## Appendix 2 - References

## DESIGN ZERO DESIGN STANDARD REFERENCES

#### Introduction

This glossary presents the sources of industry good practice which were used to develop the process, project and information requirement tables. The sources are presented by Design Guide sub-categories. Each sub-category also lists the CoLC documents which were reviewed to ensure alignment and prevent contradiction.

## **Sustainability Ratings**

- BRE Global Ltd (2022). BREEAM UK New Construction Technical Manual SD5079, Version 6.0.
- BRE Global Ltd (2020). BREEAM UK Refurbishment & Fit Out 2014 Technical Manual SD216, Version 2.0.
- Royal Institute of Chartered Surveyors (2022).
   SKArating Online Assessment Tool. Available at: <u>https://ska-tool.rics.org/</u> (Accessed: 23 Nov 2022).

- BRE Group Ltd (2022). NABERS UK Energy for Offices. Available at: <u>https://bregroup.com/</u> products/nabers-uk/nabers-uk-products/ energy-for-offices/ (Accessed: 23 Nov 2022).
- BRE Group Ltd (2022). NABERS UK Design for Performance. Available at: <u>https://bregroup.</u> <u>com/products/nabers-uk/nabers-uk-products/</u> <u>nabers-design-for-performance/</u> (Accessed: 23 Nov 2022).
- Home Quality Mark One (2018). Technical Manual England, Scotland & Wales SD239, Issue
   0.0. Available at: <u>https://www.homequalitymark.</u> <u>com/wp-content/uploads/2018/09/HQM-</u> <u>ONE-Technical-Manual-SD239-.pdf</u> (Accessed: 23 Nov 2022).
- BRE Group Ltd (2022). Available at: https:// bregroup.com/ (Accessed: 23 Nov 2022).

## **1. WHOLE LIFE CARBON**

### Whole Life Carbon Assessment

- City of London Corporation (2022). Whole Life Carbon Scoping Report.
- City of London Corporation (2022). Whole Life Carbon Checklist.
- LETI (2020). LETI Climate Emergency Design Guide: How new buildings can meet UK climate change targets.
- LETI (2020). LETI Embodied Carbon Primer: Supplementary guidance to the Climate Emergency Design Guide.
- Greater London Authority (2020). Draft Whole Life Carbon Guidance.
- Royal Institution of Charted Surveyors (2017).
   Professional Statement Whole Life Carbon.

## Embodied Carbon

- LETI (2020). LETI Climate Emergency Design Guide: How new buildings can meet UK climate change targets.
- LETI (2020). LETI Embodied Carbon Primer: Supplementary guidance to the Climate Emergency Design Guide.
- House of Commons Environmental Audit Committee (2022). Building to Net 0: Costing Carbon in Construction 2022-2023.
- Department for Business, Energy & Industrial Strategy (2020). Energy white paper: Powering our net zero future. Available at: <u>https://www.</u> gov.uk/government/publications/energy-whitepaper-powering-our-net-zero-future/energywhite-paper-powering-our-net-zero-futureaccessible-html-version (Accessed: 24 Nov 2022).

- City of London Corporation (2022). Whole Life
   Carbon Checklist.
- Royal Institution of Charted Surveyors (2017).
   Professional Statement Whole Life Carbon.

# Operational Carbon and Energy and LZC Tech

- LETI (2020). LETI Climate Emergency Design Guide: How new buildings can meet UK climate change targets.
- LETI (2020). LETI Embodied Carbon Primer: Supplementary guidance to the Climate Emergency Design Guide.
- Passivhaus Institute. <u>https://passivehouse.com/</u> (Accessed: 30 Nov 2022)

- Department for Business, Energy & Industrial
  Strategy (2020). Energy white paper: Powering
  our net zero future. Available at: <u>https://www.</u>
  gov.uk/government/publications/energy-white-paper-powering-our-net-zero-future/energywhite-paper-powering-our-net-zero-futureaccessible-html-version (Accessed: 24 Nov
  2022).
- City of London Corporation (2015). City of London Local Plan.
- BRE Global Ltd (2022). BREEAM UK New Construction Technical Manual SD5079, Issue 6.0.
- Better Buildings Partnerships, Better Metering Toolkit. <u>https://www.betterbuildingspartnership.</u> <u>co.uk/better-metering-toolkit</u> (Accessed: 30 Nov 2022)

## **Minimising Carbon**

#### **Carbon Reduction**

- City of London Corporation (2020). City of London Climate Action Strategy 2020-2027.
- LETI (2020). LETI Climate Emergency Design Guide: How new buildings can meet UK climate change targets.
- City of London Corporation (2015). City of London Local Plan.
- City of London Corporation (2019). Local Plan Monitoring Paper: Sustainable Development and Climate Change. Available at: <u>https://</u> www.cityoflondon.gov.uk/assets/Services-Environment/planning-local-plan-monitoringreport-sustainability-climate-change-2019a.pdf (Accessed: 24 Nov 2022).
- House of Commons Environmental Audit Committee (2022). Building to Net 0: Costing Carbon in Construction 2022-2023.

#### **Energy Efficiency**

- City of London Corporation (2015). Draft Local Plan.
- Department for Business, Energy & Industrial Strategy (2020). Energy white paper: Powering our net zero future. Available at: <u>https://www.</u> gov.uk/government/publications/energy-whitepaper-powering-our-net-zero-future/energywhite-paper-powering-our-net-zero-futureaccessible-html-version (Accessed: 24 Nov 2022).
- LETI (2020). LETI Climate Emergency Design Guide: How new buildings can meet UK climate change targets.

### **Minimise Pollution**

#### **Light Pollution:**

- BRE Global Ltd (2022). BREEAM UK New
   Construction Technical Manual SD5079, Issue 6.0.
- City of London Corporation (2015). City of London Local Plan.
- Speirs Major (2018). A lighting vision for the City of London.

#### **Noise Pollution:**

BRE Global Ltd (2022). BREEAM UK New Construction Technical Manual SD5079, Issue 6.0.

#### **Construction:**

US Green Building Council (2022). LEED Building Design and Construction, Issue 4.1.

#### Water Pollution:

House of Commons Environmental Audit Committee (2022). Water quality in rivers – Fourth Report of Session 2021-22.

City of London Corporation (2021). Resilience Measures Catalogue.

## **2. CIRCULAR ECONOMY**

## **Circular Economy**

- Greater London Authority (2022). London Plan Guidance: Circular Economy Statements.
- UKGBC (2022). Insights on how circular economy principles can impact carbon and value.
- https://www.london.gov.uk/sites/default/files/ design_for_a_circular_economy_primer_ggbd_ web2.pdf

## Decommissioning

- Greater London Authority (2022). London Plan Guidance: Circular Economy Statements.
- UKGBC (2022). Insights on how circular economy principles can impact carbon and value.
- BRE Global Ltd (2022). BREEAM UK New
   Construction Technical Manual SD5079, Issue 6.0.

## **Resource Efficiency**

- Greater London Authority (2022). London Plan Guidance: Circular Economy Statements.
- City of London Corporation (2022). Whole Life Carbon Scoping Report.
- Greater London Authority (2021). The London Plan: Policy SI7 Reducing waste and supporting the Circular Economy.

## 3. MATERIALS

- Greater London Authority (2022). London Plan Guidance: Circular Economy Statements.
- BRE Global Ltd (2022). BREEAM UK New Construction Technical Manual SD5079, Version 6.0.
- Reuse:
- City of London Corporation (2022). Whole Life Carbon Scoping Report.
- Greater London Authority (2022). London Plan Guidance: Circular Economy Statements

## Low Impact Materials (Insulation, Fabric)

- Greater London Authority (2022). London Plan Guidance: Circular Economy Statements.
- LETI (2020). LETI Climate Emergency Design Guide: How new buildings can meet UK climate change targets.
- Maples Teesdale (2022). Maples Teesdale 50 Shades of Green. YouTube. Available at: <u>https://www.youtube.com/watch?v=FlmbtdmmdUY</u> (Accessed: 24 Nov 2022).

 Grosvenor (2021). Accelerating material re-use. Available at: <u>https://grosvenor.com/</u> <u>materialreuse</u> (Accessed: 24 Nov 2022).

#### **Procurement of Materials**

- House of Commons Environmental Audit Committee (2022). Building to Net 0: Costing Carbon in Construction 2022-2023.
- Maples Teesdale (2022). Maples Teesdale 50 Shades of Green. YouTube. Available at: <u>https://</u> <u>www.youtube.com/watch?v=FlmbtdmmdUY</u> (Accessed: 24 Nov 2022).
- LETI (2020). LETI Climate Emergency Design Guide: How new buildings can meet UK climate change targets.
- City of London Corporation (2022). Whole Life Carbon Scoping Report.
- BRE Global Ltd (2022). BREEAM UK New
   Construction Technical Manual SD5079, Version 6.0.
- Maples Teesdale (2022). Maples Teesdale 50

Shades of Green. YouTube. Available at: <u>https://</u> www.youtube.com/watch?v=FlmbtdmmdUY (Accessed: 24 Nov 2022).

 Greater London Authority (2022). London Plan Guidance: Circular Economy Statements.

#### **Modern Methods of Construction**

 Mayor of London. Homes for Londoners: Affordable Homes Programme 2021-2026. Further readings: MMC categories and definition framework. <u>https://www.</u> london.gov.uk/programmes-strategies/ housing-and-land/homes-londonersaffordable-homes-programmes/homeslondoners-affordable-homes-programme-2021-2026#:~:text=About%20the%20 programme&text=This%20funding%20is%20 expected%20to,new%20affordable%20homes%20in%20London. (Accessed: 30 Nov 2022)

## **4. RESILIENCE**

#### **Climate Change Adaptation**

- City of London Corporation (2022). Whole Life Carbon Scoping Report.
- City of London Corporation (2022). Whole Life
   Carbon Checklist.
- City of London Corporation (2015). City of London Local Plan.
- BRE Global Ltd (2022). BREEAM UK New Construction Technical Manual SD5079, Issue 6.0.
- City of London Corporation (2020). The Guildhall Conservation Management Plan.
- Greater London Authority (2022). London Plan Guidance: Circular Economy Statements.
- Buro Happold (2020). City of London Adaptive Pathways Study. Available at: <u>https://www.</u> <u>cityoflondon.gov.uk/assets/Services-</u> <u>Environment/city-of-london-adaptive-</u> <u>pathways-study.pdf</u> (Accessed: 24 Nov 2022).

- City of London Corporation (2022). Climate Action Strategy: NZ3 – Capital Projects (Design Standards), Version 2.1.
- Architects Climate Action Network (2021).
   Passivhaus Mythbusting | ACAN | Circular Series. YouTube. Available at: <u>https://www. youtube.com/watch?v=f2Z6zBKkXKE</u> (Accessed: 24 Nov 2022).
- City of London Corporation (2022).
   Environment: Understanding Climate Risk and Resilience. Buro Happold.
- City of London Corporation (2022).
   Understanding climate risk: To help inform the development of Climate Change Adaptation and Resilience Strategies for the City of London Corporation's Wholesale Markets. Buro Happold.

## **Biodiversity, Ecology and Conservation**

#### Water Quality:

- House of Commons Environmental Audit Committee (2022). Water quality in rivers – Fourth Report of Session 2021-22.
- London Assembly Housing Committee (2017).
   At Home with Nature: Encouraging Biodiversity in New Housing Developments.

#### **Planning:**

- City of London Corporation (2020). City of London Climate Action Strategy 2020-2027.
- BRE Global Ltd (2022). BREEAM UK New Construction Technical Manual SD5079, Issue 6.0.
- London Assembly Housing Committee (2017). At Home with Nature: Encouraging Biodiversity in New Housing Developments.

#### **Mitigating Risks:**

 BRE Global Ltd (2022). BREEAM UK New Construction Technical Manual SD5079, Issue 6.0.

- US Green Building Council (2022). LEED Building Design and Construction, Issue 4.1.
- City of London Corporation (2021). City of London Biodiversity Action Plan 2021-2022.

#### **Ecological Change and Enhancement:**

- BRE Global Ltd (2022). BREEAM UK New
   Construction Technical Manual SD5079, Issue 6.0.
- House of Commons Environmental Audit Committee (2022). Building to Net 0: Costing Carbon in Construction 2022-2023.
- City of London Corporation (2021). City of London Biodiversity Action Plan 2021-2022.
- Bat Conservation Research Lab (2021).
   Bats and Light Pollution. University of the West of England, Bristol. Available at: <u>https://</u> batconservationresearchlab.co.uk/2021/02/10/ bats-and-light-pollution/ (Accessed: 23 Nov 2022).

## Flood Resilience

- BRE Global Ltd (2022). BREEAM UK New
   Construction Technical Manual SD5079, Issue 6.0.
- US Green Building Council (2022). LEED Building Design and Construction, Issue 4.1.
- City of London Corporation (2021). City of London Biodiversity Action Plan 2021-2022.
- New York City Mayor's Office of Resiliency (2020). Climate Resiliency Design Guidelines, Issue 4.0.

## **Local Air Quality**

#### **Transport:**

- BRE Global Ltd (2022). BREEAM UK New
   Construction Technical Manual SD5079, Issue 6.0.
- HM Government (2021). Transitioning to zero emission cars and vans: 2035 delivery plan.

#### **Nitrogen Oxides:**

- City of London Corporation (2020). City of London Air Quality Strategy 2019-2024.
- City of London Corporation (2020). City of London Climate Action Strategy 2020-2027.

• World Health Organisation (2006). Air quality guidelines global update 2005.

## **Fine Particulate Matter:**

- City of London Corporation (2020). City of London Air Quality Strategy 2019-2024.
- World Health Organisation (2006). Air quality guidelines global update 2005.
- City of London Corporation (2020). City of London Climate Action Strategy 2020-2027.

## **Air Quality Monitoring:**

• City of London Corporation (2020). City of London Air Quality Strategy 2019-2024

### **Passive Design**

- BRE Global Ltd (2022). BREEAM UK New
   Construction Technical Manual SD5079, Issue 6.0.
- LETI (2020). LETI Climate Emergency Design Guide: How new buildings can meet UK climate change targets.
- City of London Corporation (2015). Draft Local Plan.
- City of London Corporation (2022).
   Understanding climate risk: To help inform the development of Climate Change Adaptation and Resilience Strategies for the City of London Corporation's Wholesale Markets. Buro Happold.
- New York City Mayor's Office of Resiliency (2020). Climate Resiliency Design Guidelines, Issue 4.0.
- New York City Mayor's Office of Resiliency (2019). Naturally Ventilated Spaces.

- City of London Corporation (2019). Local Plan Monitoring Paper: Sustainable Development and Climate Change. Available at: <u>https://</u> www.cityoflondon.gov.uk/assets/Services-Environment/planning-local-plan-monitoringreport-sustainability-climate-change-2019a.pdf (Accessed: 24 Nov 2022).
- US Green Building Council (2016). LEED Minimum energy performance, Issue 4.0.
- Passivhaus Institute. <u>https://passivehouse.com/</u> (Accessed: 30 Nov 2022)

## 5. WELLBEING

## **Community Engagement:**

- City of London Corporation (2015). City of London Local Plan.
- Department for Business, Energy & Industrial Strategy (2020). Energy white paper: Powering our net zero future. Available at: <u>https://www.</u> gov.uk/government/publications/energy-whitepaper-powering-our-net-zero-future/energywhite-paper-powering-our-net-zero-futureaccessible-html-version (Accessed: 24 Nov 2022).
- City of London Corporation (2020). City of London Reduction and Recycling Plan.
- Buro Happold (2020). City of London Adaptive Pathways Study – Appendix D: Resilience Measures. Available at: <u>https://</u> <u>www.cityoflondon.gov.uk/assets/Services-</u> <u>Environment/city-of-london-adaptive-</u> <u>pathways-study-appendix-d.pdf (Accessed: 24</u> Nov 2022).

 City of London Corporation (2022). Climate Action Strategy: NZ3 – Capital Projects (Design Standards), Version 2.1.

## **WELL Type Requirements**

The WELL Building Standard[™] version 2 (Q3 2022).

# **6. POE**

Page 482

• Listed above in the operational carbon and energy subcategory references.

## **Embodied Carbon**

• Listed above in the embodied carbon subcategory.

## **Energy and Water Monitoring**

- BRE Global Ltd (2022). BREEAM UK New
   Construction Technical Manual SD5079, Issue 6.0.
- LETI (2020). LETI Climate Emergency Design Guide: How new buildings can meet UK climate change targets.
- City of London Corporation (2015). City of London Local Plan.
- Grosvenor (2022). Environmental Leadership.
- City of London Corporation (2022).
   Environment: Understanding Climate Risk and Resilience. Buro Happold.

- City of London Corporation (2022).
   Understanding climate risk: To help inform the development of Climate Change Adaptation and Resilience Strategies for the City of London Corporation's Wholesale Markets. Buro Happold.
- City of London Corporation (2022). Resilience
  Measures Catalogue.
- International WELL Building Institute (2020).
   WELL W09 Onsite Non-Potable Water Reuse, Issue 2.0. Available at: <u>https://v2.wellcertified.</u> <u>com/en/v2.1/water/feature/9</u> (Accessed: 24 Nov 2022).

## **Local Air Quality**

• Listed above in the local Air quality subcategory.

## **WELL Type Requirements**

• Listed above in the WELL type requirements subcategory.

## Introduction

This section presents a summary of the asset classes the Design and Technology Guides apply to and the symbols used in the tables.

## **ASSET CLASSES & SYMBOLS**

## **Symbols**

 ✓ - Applicable: to this asset, class, type, value, stakeholder

• - Circumstantial: further analysis and/or surveying required to determine applicability

BLANK - Not applicable: to this asset, type, value, stakeholder

### Residential

- Designed to meet the function of a long-term self-contained home even though there may be some provision of communal facilities which can be used on a voluntary basis
- Classified under Building regulations Part L1a (i.e. required to complete SAP assessments)
- Homes for sale, social housing or homes for rent (PRS and Built to Rent), some student and retirement/sheltered accommodation where the units are comparable to a normal self-contained flat/home

#### NOTE:

- The term 'multi-residential' is used in the context of buildings that contain rooms for residential purposes alongside communal facilities for catering, leisure, care, etc. These residential rooms would normally not have the full, self-contained functions of a home. This is more specialist residential care homes, student halls of residence, and other more communal accommodation. The scheme can cater for a small number of selfcontained dwellings where these form part of a larger multi-residential development (e.g. on-site warden homes etc.).
- Provided for transient / non-permanent occupants
- Provide suitable accommodation for occupants requiring support from carers, wardens or similar
- Include shared living spaces

- Be classified under Building regulations Part L2a (i.e. required to complete SBEM assessments, but can account for some SAP assessed spaces where associated with the project)
- · Rooms rather than self-contained flats or homes

### Commercial

#### Office

- General office buildings
- Offices with research and development areas (i.e. category 1 laboratories only)

#### Industrial

- Industrial unit warehouse storage or distribution
- Industrial unit process, manufacturing or vehicle servicing

#### Retail

- Shop or shopping centre
- Retail park or warehouse
- 'Over the counter' service provider, e.g. financial, estate and employment agencies and betting offices
- Showroom
- Restaurant, café and drinking establishment
- Hot food takeaway

## Public (non-housing)

#### Education

- Preschool
- Schools and sixth form colleges
- Further education or vocational colleges
- Higher education institutions

#### Healthcare

- Teaching or specialist hospitals
- General acute hospitals
- Community and mental health hospitals
- GP surgeries
- Health centres and clinics

### Prison

- High security prison
- Standard secured prison
- Young offender institution and juvenile prisons
- Local prison
- Holding centre

## Law Court

- Law courts
- Crown and criminal courts

- County courts
- Magistrates' courts
- Civil justice centres
- Family courts
- Youth courts
- Combined courts

Also included within the public categorisation are:

#### **Residential Institution (short term stay)**

- Hotel, hostel, boarding and guest house
- Secure training centre
- Residential training centre

#### **Non-residential Institution**

- Art gallery, museum
- Library
- Day centre, hall, civic or community centre
- Place of worship

#### **Assembly and Leisure**

- Cinema
- Theatre, music or concert hall
- Exhibition or conference hall
- Indoor or outdoor sports, fitness and recreation centre (with or without pool)

#### Other

- Transportation hub (coach or bus station and above ground rail station)
- Research and development (category 2 or 3 laboratories non-higher education)
- Crèche
- Fire stations
- Visitor centres

## **FURTHER READING**

## **RIBA**

- The RIBA Plan of Work is the definitive model for the design and construction process of buildings
- <u>http://xn--https-ix3b//riba-prd-</u> <u>assets.azureedge.net/-/media/Files/</u> Resources/2020RIBAPlanofWorkoverviewpdf-(1).
- <u>https://riba-prd-assets.azureedge.</u> <u>net/-/media/GatherContent/Business-</u> <u>Benchmarking/Additional-Document</u> <u>s/2020RIBAPlanofWorktemplatepdf.</u> <u>pdf?rev=6f995f6f39d2414daf50889b00a7ecb4</u>

### UKGBC

- The UK Green Building Council (UKGBC) is a charity organisation launched by the Construction and Property industry in 2007. They offer clarity, cohesion and leadership across the built sector towards a sustainable build environment.
- The UKGBC share knowledge and best practice and advocate progressive policy and have produced the Net Zero Whole Life Carbon Roadmap for the Built Environment.
- Welcome to UKGBC | UK Green Building
   Council
- Net Zero Whole Life Carbon Roadmap for the Built Environment - UKGBC - UK Green Building Council

## LETI

- Originally the 'London Energy Transformation Initiative' LETI was established to support the transition of London's built environment to meet net zero carbon. It has now gown and become the Low Energy Transformation Initiative commonly known as LETI to reflect the interest in all IK zero carbon policy and regulation.
- In 2020 LETI published the Climate Emergency Design Guide which outlines the requirements for new buildings to ensure climate change targets are met.
- Climate Emergency Design Guide | LETI
- Home | LETI

## **RICS Whole Life Carbon Assessment**

- The RICS (Royal Institute of Chartered Surveyors) have developed a comprehensive set of guidance for Whole Life Carbon Assessments for the Built Environment.
- The Guidance mandates a whole life approach to reducing carbon and sets of specific mandatory principles and supporting guidance for the interpretation and implementation of EN 15978 methodology.
- EN15978 is an assessment of environmental performance of buildings.
- The Whole Life Carbon objectives include providing a consistent whole life carbon assessment implementation plan and reporting structure for built projects, and promoting the reliability of whole life carbon assessments by acting as a solid reference in the industry.
- Whole Life Carbon Assessment for the Built Environment, 1st edition (rics.org)

## SUSTAINABILITY ACCREDITATIONS AND REFERENCES

Please note the terms outlined below are used across topic categories and are not used solely within Operational or Construction etc.

### BREEAM

- Building Research Establishment Environmental Assessment Method (BREEAM)
- <u>https://bregroup.com/products/breeam/</u>
- BREEAM is the world's leading science-based suite of validation and certification systems for sustainable built environment.
- Since 1990, BREEAM's third-party certified standards have helped improve asset performance at every stage, from design through construction, to use and refurbishment.
   Millions of buildings across the world are registered to work towards BREEAM's holistic approach to achieve ESG, health, and net zero goals. It is owned by BRE – a profit-for-purpose organisation with over 100 years of building science and research background.
- BREEAM Advisory Professional (AP)

- <u>https://www.breeam.com/wp-content/</u> uploads/sites/3/2018/06/GD121_BREEAM_
   <u>Professionals_Guide_Briefing_Paper_v.0.0.pdf</u>
- The BREEAM AP can be called on and provide 'scheme-related' expertise to design teams, specifiers, constructors and other key stakeholders. This will inform decision-making and therefore identify opportunities to maximise performance and work towards a targeted rating in the most cost-effective, timely and solutions orientated way.
- An AP can work for a construction organisation frequently undertaking BREEAM-related work. Moreover, the BREEAM AP can be the same person as the BREEAM Assessor. This allows flexibility and versatility of their role.
- Cost efficiencies are expected where the appointed licensed assessor also acts as the BREEAM AP for a project.

 In either case, an efficient AP will coordinate with the BREEAM Assessor to ensure an efficient and smooth assessment process, aiming to maximise the performance of the assessed project.

An individual with a high level of general knowledge of the scheme(s) principles, requirements and processes. They also have the skills and experience needed to inform, guide and facilitate project teams throughout the BREEAM process. APs assist project teams in their individual and collective decision-making and evidence preparation throughout a project with a view to optimise performance, assessment management and efficiency.

 In doing so the AP can support project teams in obtaining maximum value and cost-effective performance from the use of BREEAM throughout the project life, whilst managing risks and staying on course to achieve the target rating. Additional BREEAM requirements associated
 with specific credits and categories can be
 found within the Topic categories Sections

#### LEED

- The Leadership in Energy and Environmental Design commonly referred to as LEED Is a Green Building Certification program used globally. It was developed by the USGBC and includes a rating system for the design, construction, operational and maintenance of green buildings.
- LEED uses a similar requirements system to BREEAM, with credits being broken down into topics surrounding Energy, Waste, Materials, Health and Wellbeing etc. LEEDs thresholds are based on percentages whilst BREEAM uses quantitative standards.
- LEED is considered to be simpler in its approach however BREEM is the more popular accreditation method chosen in the UK.

- Home | LEED Lookbook (usgbc.org)
- LEED certification for new buildings | U.S. Green Building Council (usgbc.org)

#### WELL

- The WELL building standard differs from LEED or BREEAM due to being predominantly health focused, however aspects of sustainability, environmental management and carbon reduction do align with health benefits.
- WELL is a performance based system for measuring, certifying and monitoring features of the build environment that impact human health and well-being through air, water ,nourishment, light, fitness comfort and mind.
- WELL Certification | WELL Standard (wellcertified.com)

#### Passivhaus

- Passivhaus is an international standard for reducing the ecological footprint of a building by building them to be ultra-low in energy consumption.
- Passivhaus adopts a whole-building approach with clear, measured targets, focusing on high quality construction, certified through an exacting quality assurance process.
- To achieve Passivhaus Standard in the UK typically involves;
- Accurate design modelling using the Passive House Planning Package (PHPP) very high levels of insulation extremely high performance windows with insulated frames airtight building fabric 'thermal bridge free' construction a mechanical ventilation system with highly efficient heat recovery
- https://passivehouse.com/

## **SKA Rating Self-Assessment**

- SKA rating is an environmental assessment method, benchmark and standard for nondomestic fit-outs, led and owned by the Royal Institute of Chartered Surveyors (RICS).
- Projects use the SKA rating method to carry out an informal self-assessment of the environmental performance of their fit-out as well as;
- Commission a quality-assured assessment and certificate from an RICS accredited SKA assessor
- Obtain clear guidance on good practice in fit-out and how to implement it.
- Benchmark the performance of fit-outs against each other and the rest of the industry.
- There are three rating thresholds that can be achieved : Bronze, Silver and Gold reaches by achieving 25,50 and 75% respectively.

## **NABERS UK**

- Nabers UK is a simple and reliable system for rating the energy efficiency of office buildings across England, Wales, Scotland and Northern Ireland.
- Nabers offers two products, UK Design for performance and Nabers UK – Energy for Offices.
- Nabers Energy measures the efficiency of an office building and rates its performance by comparing the energy consumption of a building against a set of benchmarks.
- Nabers Design for Performance is a process whereby a developer of owner commits to design, build and commission a new office development or major refurbishment to achieve a specific Nabers rating.
- Star Ratings range from one to six for building efficiency across Energy, Water, Waste, and Indoor Environment.

## Home Quality Mark (HQM)

- The Home Quality Mark helps house builders to demonstrate the high quality of their homes and to differentiate them in the marketplace.
- HQM was developed by BRE and is based on years of building standards experience.
- HQM provide a rating out of 5 stars across 3 indicators, Cost, Wellbeing and Footprint which is ranked on a five-point scale. Additional minimum requirements need to be met.

#### BRUKL

- BRUKL (Building Regulations United Kingdom Part L) calculations are used to predict energy efficiency of new construction. If you are constructing a new non domestic building in the UK you will need to have BUKL calculations complete by an accredited energy assessor in order to obtain an EPC on completion of your property.
- BRUKL Reports are also known an SBEM calculation reports (Simplified Building Energy Model).

## BBP

- The Better Buildings Partnership (BBP) brings together a number of the largest commercial and public property owners in London in one collaborative organisation. All members are working together to improve the sustainability of London's existing commercial building stock and accelerate the reduction in CO₂ emissions from these buildings.
- Better Metering Toolkit sets out the metering options currently available for commercial buildings, considers the costs and benefits and provides advice on how metering data can be used to make energy, cost and CO₂ reductions

#### **Carbon Buzz**

• Carbon Buzz is a RIBA and CIBSE platform in which users are able to analyse and compare data entered for their buildings at each project stage through energy and carbon graphs known as Energy Bars. The user is then able to track, review and compare energy records as a form of data monitoring.

### CIBSE

 CIBSE is the Chartered Institute of Building Services Engineers. They provide guidance documents for a range of building aspects including TM54; Evaluating Operational Energy use at the design stage (2022) which provides a methodology to calculate energy performance including spreadsheet and dynamic simulation modelling.

#### **RICS New Rules of Measurement (NRM)**

- The RICS New Rules of Measurement provides a standard set of measurement rules and essential guidance for the cost management of construction projects and maintenance works. The three volumes of the NRM include;
  - a. NRM 1: Order of cost estimating and cost planning for capital building works
  - b. NRM 2: Detailed measurement of for building works
  - c. NRM 3: Order of cost estimating and cost planning for building maintenance works

• The NRM form the basis on the Circular Economy Statement, outlining the application stage in the Bill of Materials Building Layers and their life span

### **Circular Economy Statement (CE)**

- Circular economy is an economic model of production and consumption that involved sharing, leasing, reusing, repairing, refurbishing and recycling existing materials and products as long as possible, in order to minimise the effects on climate change, biodiversity loss, waste and pollution.
- A CE statement (CES) is a detailed appraisal of the potential material that can be reused from an existing project side ,some of the contents include a description of the development, method statement , circular economy aspirations and statement, and detailed circular economy statement.

 Circular Economy Statement Guidance | GLA (london.gov.uk)

#### **Environment Act 2021**

 The Environment Act 2021 is a government bill that makes provision about targets, plans and policies for improving the natural environment; for statements and reports about environmental protection; for the Office for Environmental Protection; about waste and resource efficiency; about air quality; for the recall of products that fail to meet environmental standards; about water; about nature and biodiversity; for conservation covenants; about the regulation of chemicals; and for connected purposes.

### **Mitigation Hierarchy**

• A mitigation hierarchy is a widely used tool that guides users towards limiting as far as possible the negative impacts on biodiversity from development projects. It emphasises bestpractice of avoiding and minimising any negative impacts, and then restoring site no longer used by a project before finally considering offsetting residual impacts.

CSBI (Cross Sector Biodiversity Initiative) provide a comprehensive mitigation hierarchy guide to implement effectively: Mitigation Hierarchy Guide – CSBI

#### **Sustainability Statements**

 A Sustainability Statement is a report showing how a developer will address local objectives concerning environment and sustainability. It covers all aspects of the environmental impact of a planned development alongside targets surrounding CO₂ emissions and Renewable energy and more. Energy efficiency is the use of less energy to operate the same equipment and / or preform the same task to produce the same result. Energy efficiency measures include double glazing, cavity wall insulation of energy efficient lighting. Minimise pollution is limiting the amount and toxicity of hazardous substances though all stages of product or building life.

#### **Heat Island Effect**

• The heat island effect is a term used to describe higher air and structure temperatures in an urban setting. It is a common environmental problem occurring in metropolitan areas in which the air temperature is significantly higher, leading to a smoggy climate.

#### **Climate Change Adaptation Strategy**

A Climate Change Adaptation Strategy is a strategy developed by the design team and other relevant stakeholders for a specific project or programme of works, that involves recommendations and solutions to adjusting to the current or expected effects of climate change. This includes protection against flooding, sea level rise, heatwaves and increase of high-risk weather events.

## Post Occupancy Evaluation (POE)

- Post Occupancy Evaluation.
- POE is also known as Building Performance Evaluation (BPE).
- The POE is used to improve the building operation, occupants' comfort and other areas based on its outcomes. Therefore, the POE provides suggestions on potential improvements, including, but not limited to the following:
  - a. Re-commissioning activities.
  - b. Measures that maintain or improve end users' comfort and productivity.
  - c. Health and safety.
- A POE can also be used as part of the stakeholder consultation at the briefing stage for a new construction or the refurbishment of an existing one, in cases where the building occupants are the same. This can be achieved through the use of a questionnaire or workshops to highlight lessons from the old or existing

building that could be taken into account in the design of the new project.

#### Whole Life Carbon Assessments

The City of London is embedding circular economy principles into their capital projects and reducing carbon intensity by using lifecycle carbon and cost assessment techniques and design specifications, identified as an action to support the targets and achievement of net zero. The CoLC requires stakeholders to undertake WLC Assessments using the CoLC Assessment checklist. Together with the WLC methodology, the WLC Assessments will support the CoLC to ensure all future capital projects (refurbishments and new build) meet the highest commercially viable standards for sustainable and low carbon design.

The CoLC also commissioned works to undertake a Whole Life Cycle Carbon (WLCC) assessment exercise on six chosen projects, and to estimate the carbon and cost impact of suggested optimisation measures which would reduce the WLC emissions. The six projects selected include new build and refurbishments, offices, a café and schools:

- Finsbury Gardens Pavilion
- 15-17 Eldon Street
- 1st-5th/6 Broad Street Place
- Brewery Road
- CoL Junior School
- COLPAI- CoL Primary Academy and Islington

For each project, the WLC was calculated, including optioneering providing e.g. alternative material choices to help reduce the WLC carbon emissions. The optimisation measures were then costed, and a menu of the measures was created based on the cost of the optimisation in £/kgCO2e saving. The lower the cost in £/kgCO2e, the bigger the carbon saving for a lower financial cost of investment. The recommended measures were tailored to each project and tabulated in a results report. These measures have also been reviewed and incorporated into the Standard as part of the Project Requirements.

### **Climate Impact Modelling**

In support of the CAS, there was a requirement for Impact Modelling for CPG and IPG Assets on temperature and pluvial / fluvial flooding. This was split into two phases:

- Phase 1: Modelling to identify assets with heightened risk and the need for enhanced resilience and mitigation measures.
- Phase 2: Modelling the impact of specific resilience and mitigation measures on key assets, providing insight into the scope and specifications of the interventions to be adopted.

The purpose therefore was to:

- Identify the risks associated with Resilience posed throughout the Square Mile (and other CoL building assets located throughout London) for residential and non-residential properties which fall under the remit of CoLC.
- Identify a set of proposed interventions and any constraints to the implementation of intervention measures for the CoLC physical assets. These proposed interventions and constraints for the CoLCs physical assets informed this sub-category as well as the Flood Resilience sub-category, and fed into the future proofing recommendations for the Technology Guide including Fabric and Cooling – please see Appendix 1. A full report of the findings is made available outside this Standard.

The work comprised building a Digital Twin of The Square Mile, using powerful data GIS tools to provide impactful and easy to interpret visualisations of the climate impacts and the effect of proposed interventions. The model was built, using Tygron software -Tygron EN Geo design Platform | Water and climate adaption. The outputs to support reporting were produced for the 'Top 100 CoLC Assets' and provided in GIS format for use by CoLC.

The results of the Tygron modelling exercise were overlayed onto the GIS dashboard to visually present at-risk areas of flooding and high temperature within the Square Mile. This interactive tool is available to the users of this Standard for identifying buildings of interest and identifying the risks identified through modelling. The tool also shows potential interventions identified to mitigate the risk. It will allow planners and asset managers to prioritise implementation of interventions, Page 495

dependant on the asset's risk rating and help make informed decisions on funding allocation. It will also allow for protection of the asset, inside and out and building on learnings from past projects. The intervention measures are split between heat stress and flooding, and categorised for new assets and retrofits along with risks, benefits and timeframes detailed. Being digital, the tool will allow periodic updates to the asset list and location data as it evolves. This model will be hosted on Arcadis Arc GIS which CoLC staff have access licenses for.

Refer to Buildings Resilience Plan. Climate Impact Modelling Tool

## // Building Blocks for Net Zero

Appendix 3 - Abbreviations



## **ABBREVIATIONS**

AP	Accredited Professional				
ASHP	Air Source Heat Pump				
ASHRAE	The American Society of Heating, Refrigerating and Air-Conditioning Engineers				
BAU	Business as Usual				
BBP	Better Buildings Partnership				
BEMS	Building Energy Management System				
BER	Building Emission Rate				
BIM	Building Information Modelling				
BMS	Building Management Systems				
BRE	Building Research Establishment				
BREEAM	Building Research Establishment Environmental Assessment Method				
BRUKL	Building Regulations UK Part L				
BS	British Standard				
<b>BSIEN</b>	British Standards Institute Adopted as a European Standard				
CAS	Climate Action Strategy				
CCS	Considerate Constructor's Scheme				
CDM	Construction Design and Management				

CE	Circular Economy				
CIBSE	Chartered Institution of Building Services Engineers				
CoL	City of London				
CoLC	City of London Corporation				
CPG	Capital and Planning Group				
СРО	Compulsory Purchase Order				
DEC	Display Energy Certificate				
DEFRA	Department for Environment, Food and Rural Affairs				
DELC	Direct Effect Life Cycle				
DNO	Distribution Network Operator				
DSM	Dynamic Solution Model				
DT	Design Team				
EPC	Energy Performance Certificate				
EPD	Environmental Product Declaration				
EQ	Environmental Quality				
EUI	Energy Use Intensity				
FF&E	Furniture, Fixtures and Equipment				

Page 498

FITWEL	Facility Innovations Toward Wellness Environment Leadership			
FM	Facility Manager			
GHG	Greenhouse Gas			
GIA	Gross Internal Area			
GLA	Greater London Authority			
GWP	Global Warming Potential			
HQM	Home Quality Mark			
HSE	Health and Safety Executive			
HVAC	Heating, Ventilation and Air Conditioning			
IAQ	Indoor Air Quality			
IES	The Institution of Environmental Sciences			
ILP	Institute of Lighting Professionals			
IPG	Investment Property Group			
ISO	International Organisation for Standardisation			
KPI	Key Performance Indicator			
kWh	Kilowatt Hours			

LCA Life Cycle Assessment

LE	Land Use and Ecology					
LED	Light-Emitting Diode					
LEED	Leadership in Energy and Environmental Design					
LETI	London Energy Transformation Initiative					
LT	Location and Transportation					
LZC	Low and Zero Carbon (Technologies)					
MEP	Mechanical, Electrical and Plumbing (Systems or Engineers)					
MCERTS	Monitoring Certification Scheme					
MERV	Minimum Efficiency Reporting Value					
ММС	Modern Methods of Construction					
NABERS	National Australian Build Environment Rating System					
NCM	National Calculation Methodology					
NOx	Nitric Oxide (NO) and Nitrogen Dioxide (NO2)					
NPPF	National Planning Policy Framework					
NRM	New Rules of Measurement					
PM	Project Manager					

POE	Post Occupancy Evaluation
ppb	Parts per Billion
ppm	Parts per Million
RAID	Risks, Assumptions, Issues, Dependencies
RFI	Request for Information
RIBA	Royal Institute of British Architects
RICS	Royal Institute of Chartered Surveyors
SBEM	Simplified Buildings Energy Model
SBTi	Science Based Targets initiative
SKA	Skansen Rating
SLR	Sea Level Rise
SME	Subject Matter Experts
SQE	Suitably Qualified Ecologist
SR	Solar Reflectance
SRI	Solar Reflectance Index

- **SuDS** Sustainable Drainage Systems
- TM54Technical Memorandum 54

TSVOC	Total Semi-Volatile Organic Compound			
TVOS	Total Volatile Solids			
VOC	Volatile Organic Solvents			
VRF	Variable Refrigerant Flow			
WC	Water Closet			
WELL	WELL Building Standard			
WHO	World Health Organisation			
WLC	Whole Life Carbon			

## **LIST OF FIGURES**

Figure 1	Standard alignment with RIBA Project Delivery Stages and City of London
Figure 2	Six Design Standard Categories
Figure 3	Flow chart of WLC process
Figure 4	The EN 15978 life cycle boundaries    19
Figure 5	Net Zero Design Standard Project Delivery Team
Figure 6	Standard Defined Roles & Requirements
Figure 7	Mandatory implementation of listed categorised projects
Figure 8	An illustration of the interdependencies with the Net Zero Design Standard
Figure 9	Process steps to gather sustainability requirements and align to CoLC targets
Figure 10	Cavity Wall
Figure 11	External Solid Wall Insulation
Figure 12	Room in Roof Insulation.
Figure 13	Solid Floor Insulation
Figure 14	Example Schematic of Ground Source Heat Pumps and the vapour compression cycle

U	
b	
g	
Ð	
S	
0	
~	

Figure 15	Example Schematic of Air Source Heat Pump	124
Figure 16	Open Loop Ground Source Heating and Water Source Heating	126
Figure 17	Example of Closed Loop Ground Source Heating.	127
Figure 18	Example schematic of a bivalent system	130
Figure 19	Example schematic of centralised domestic hot water supply	136
Figure 20	Example schematic of Use domestic hot water supply	137
Figure 21	Example schematic of solar thermal system	138
Figure 22	Example schematic of Chiller coupled with Dry Air Cooler or Cooling Tower Heat Rejection Plant	140
Figure 23	Example schematic VRF Cooling System	141
Figure 24	Example schematic hybrid VRF system	142
Figure 25	Example schematic of Air Handling Unit	144
Figure 26	Example schematic of an Ground-Air Heat Exchanger	145
Figure 27	Example schematic of Localised Extract Fan	146
Figure 28	Example schematic heat recovery	147
Figure 29	Example schematic of an Ground-Air Heat Exchanger	152



## CONTACTS:

Joanne Hunneybell Joanne.Hunneybell@cityoflondon.gov.uk

Ola Obadara ola.obadara@cityoflondon.gov.uk

Building blocks of net zero design

# City of London Corporation

Arcadis

Net Zero Design Standard Tracker 23/06/2023 Value:

Project Name: Asset type: Class: Value: Value: Current RIBA Stage: Number of Sub-categories completed:

Category and Sub-	Critoria	Project Requirement	Completed? (Y/	N Information Requirement	<b>Completed?</b> KPIs met? (Y/	N / Process	Process Requirements met	for Process Process Proc	ess Process Process Comments / Validation statement for criter	ria not
categories		Air pollution	/ N/A)	Minimise Pollution	(Y/N / N/A) N/A)	in RIBA 1?	in RIBA 2? Excellent	in RIBA 3? in RIBA 4? in RIB	A 5? in RIBA 6? in RIBA 7? met	
Minimise carbon	Minimise pollution	<ul> <li>Monitoring &amp; Plans</li> <li>1. The City Corporation will monitor air quality to assess compliance with Air Quality Limit.</li> <li>2. Nitrogen dioxide monitoring – continuous analysers will be used to monitoring Nitrogen dioxide levels, producing average hourly readings. These will be calibrated twice a year.</li> <li>3. Data will also be collected from diffusion tubes across 100 locations in the square mile to compare levels to the annual mean limit value and detecting hot spots.</li> <li>4. Pollutant alerts with messages for City Air Smart Phone app based on air quality data when pollutant levels are high.</li> <li>5. Annual assessments of air quality to ensure levels are within the guidelines.</li> <li>6. Develop a plan for reducing the air quality impact on days of high and very high air pollution.</li> <li>7. Develop a logistics approach that avoids deliveries during peak congestion and pedestrian footfall times.</li> <li>8. All new developments to be air quality neutral as a minimum and developments subject to an Environmental Impact Assessment to be Air Quality Positive in line with the requirements of the emerging London Plan.</li> </ul>		Low Zero Carbon Technology options						1. Whole Life Carbon Assessmen t
		Air Pollution City of London Transport 1. Ensure that subject to operational requirements, 100% of vehicles owned or leased by the City Corporation are electric or hybrid by 2025. 2. Require electric or hybrid vehicles as a default for the Corporate taxi contract, together with annual emission reduction targets. 3. Require zero emission and electric or hybrid vehicles as a default for courier contracts, together with annual emission reduction targets. 4. Have an entirely zero emission fleet by 2037 at the latest.								
	Circular economy	<ul> <li>A Circular Economy Statement should be submitted, to demonstrate:</li> <li>Dow all materials arising from demolition and remediation works will be re-used and/or recycled.</li> <li>Dow the proposal's design and construction will reduce material demands and enable building materials, components and products to be disassembled and re-used at the end of their useful life.</li> <li>Dopportunities for managing as much waste as possible on site.</li> <li>Adequate and easily accessible storage space and collection systems to support recycling and re-use.</li> <li>Dow much waste the proposal is expected to generate, and how and where the waste will be managed in accordance with the waste hierarchy.</li> </ul>		Circular Economy Statement.						
Circular economy	Design Principles	<ul> <li>•Bow netformance will be monitored and reported</li> <li>•Bow performance will be monitored and reported</li> <li>1. Maximise re-use: re-use the existing asset, recover materials and products on site or from another site, share materials or products for onward re-use.</li> <li>2. Design for optimisation: longevity, flexibility, adaptability assembly, disassembly, and recoverability.</li> <li>3. Use standardisation: Designing and constructing buildings that apply standardised elements or modular designs for materials and products that enable a reduction in construction waste and easier re-use in next life.</li> </ul>								
	Building in Layers	<ul> <li>4. Product as a service: Establish and promote a payment structure through which customers have unlimited access to resources but only pay for what is used, or for the result linked to their use. This represents a transition from selling products to selling services.</li> <li><u>5. Minimise impact and design waste out: use low impact new materials, use recycled content or secondary materials, design out waste, and reduce construction impact.</u></li> <li>1. RICS New Rules of Measurement (NRM) form the basis of CE statement reporting, outline application stage in the Bill of Materials.</li> <li>Building layers and their life span:</li> </ul>								
Decommissioning	Adaptable Design	<ul> <li>         • Site NPM &amp;         1. Conduct a study to explore the ease of disassembly and the functional adaptation potential of different design scenarios, followed by recommendation and solutions covering:         • Descriptions for multiple building uses and area functions based on design details, e.g. modularity.         • Routes and methods for major plant replacement, e.g. networks and connections have flexibility and capacity for expansion.     </li> </ul>		Circular Economy Statement. Fuctional adaptability Strategy						2. Circular Economy
	Demolition Materials	<ol> <li>Complete a pre-demolition audit of any existing buildings, structures or hard surfaces being considered for demolition to determine how all materials arising from demolition and remediation works will be re-used and/or recycled. The audit must account for emissions associated with decommissioning and could be completed as part of the Circular Economy Statement.</li> <li>The waste hierarchy should be followed to firstly prevent waste being generated, preparing for re-use, recycling, recovery and finally disposal.</li> <li>Follow the Circular Economy principles for New Builds: waste reduction is planned from the project inception to completion, re-using secondary products and materials.</li> <li>Follow the Circular economy hierarchy for existing buildings: Retain, Refit, Refurbish, Reclaim/re-use, Remanufacture, Recycle.</li> <li>Follow the Decision Tree for Design approaches for existing structures/buildings.</li> </ol>	N/A	Circular Economy Statement. Site Waste Management Plan						
Resource efficicency	Design	<ol> <li>Review opportunities for re-use and retention of existing buildings in line with the Decommissioning Category requirements.</li> <li>Architect shall undertake feasibility on building retention and re-use and advise whether brief can be met by using existing building.</li> <li>Undertake pre-demolition / pre-refurbishment audit inline with Decommissioning Category requirements. This will help identify which building elements need to be replaced and therefore assessed from an embodied carbon perspective.</li> <li>All buildings should be designed to allow for future adaptation and change of function in line with the principles of a Circular Economy, Design Principles to extend their life.</li> </ol>								
	Construction	<ol> <li>Encourage waste minimisation and waste prevention through the re-use of materials and using fewer resources in the production and distribution of products.</li> <li>Meet the target for construction and demolition waste of 95 per cent re-use/recycling/recovery.</li> <li>Identify re-used or recycled materials and aim for at least 20% recycled or re-used content.</li> </ol>		Materials Management Plan						
Low impact materials	Re-use/Recycle	<ol> <li>Re-use materials from demolished buildings and design future buildings for disassembly, to allow for materials to be re-used.</li> <li><u>3. Circular economy statements need to demonstrate how materials resulting from demolition and remediation works will be re-used/recycled.</u></li> <li>Use low-carbon building materials such as low-carbon cement.</li> <li>Sustainably sourced materials to be used in construction.</li> </ol>		Site waste management plan						
	Sourcing materials	<ol> <li>Carry out material efficiency review to determine whether all materials proposed are necessary.</li> <li>Specify and use Locally source materials.</li> <li>Ensure longevity of materials.</li> </ol>		Responsible sourcing certificates						
Procurement of matera	als Construction	<ol> <li>Undertake a pre-demolition / pre-refurbishment audit to identify opportunities for building (or building components) re-use.</li> <li>Use a sustainable procurement plan that covers the following as a minimum:         <ul> <li>Procure construction products locally where possible.</li> <li>Include sustainability aims, objectives and strategic targets to guide procurement activities.</li> <li>Identify the risks and opportunities of procurement against a broad range of social. environmental and economic issues.</li> </ul> </li> </ol>		Bill of Materials.         Circular Economy Statements         Following CoLC Procurement Code         Development of material durability optioneering throughout RIBA stages						3. Materials
Material durability	Design	<ol> <li>Design for adaptability or flexibility.</li> <li>Design for disassembly.</li> <li>Design to avoid a premature end of life for all components through considering maintenance and durability.</li> <li>Design to prevent water damage.</li> </ol>								
Modern methods of construction	Re-use Modern methods of construction	<ol> <li>Undertake a pre-demolition / pre-refurbishment audit to identify opportunities for building (or building components) re-use.</li> <li>If re-use is not possible, materials may be carefully and selectively separated for processing and recycling into new elements, materials, and objects.</li> <li>Include the type of MMC that will be deployed within the delivery programme inline with the GLA guidelines.</li> <li>Disclose whole life carbon performance at in use stage.</li> </ol>		Development of modern methods of construction optioneering throughout RIBA stages						
		<ol> <li>Solar shading to prevent solar gain through glazing.</li> <li>High thermal mass of building fabric to moderate temperature fluctuations. operate cooling stations</li> <li>Passive ventilation and heat recovery - elemental approach to buildings that cannot be sufficiently retrofitted to get as close to passivhaus standards as possible.</li> <li>Cool streets programme, pedestrian tunnels</li> <li>Heat resilient public realm and highway surfaces.</li> <li>Minimise contribution to the urban heat island effect.</li> <li>Self-standing structures such as canopies and shade sails.</li> </ol>		Asset identification Sustainability Statements Risk Assessment and risk workshop Confirmation of intervention measures designed in and installed / implemented (drawings, specifications	5,					
	Overheating	<ol> <li>8. Incorporate pools and fountains in the public realm to increase cooling effect. utilise seawtaer / riverwater cooling as appropriate</li> <li>9. Improving air tightness of buildings that are mechanically ventilated / cooled, minimises how hard the mechanical units need to work to maintain temperatures.</li> <li>10. Consider painting external facades and roofs with paints that reflect solar radiation.</li> <li>11. Phase Change Materials - store and release energy in the form of latent heat to reduce reliance on mechanical cooling systems.</li> <li>12 Prioritise cooling to specific areas only - work with building occupiers to agree plans to only occupy and operate specific cool areas during high heat days, and adjust all services to operate in specific areas only. Also oversize cooling systems.</li> <li>13. Live information of internal conditions</li> <li>14. Reflective window films and photochromic glazing, reduction of window sizes on south/east/west facades.</li> <li>15. Integrate Adiabatic Cooing - direct spraying water into ventilation systems</li> <li>16. Greening of publicn spaces, tree planting, green roofs / walls</li> </ol>		photpgraphs, etc.) Flood Risk Assessment						
	Flooding	<ol> <li>Flood risk assessment and mitigation.</li> <li>Sacrificial land and/or natural flood risk management areas.</li> <li>Flood defence assets maintenance and management regimes - protect key assets, critical infrastructure and sensitive equipment in flood zones.</li> <li>Sustainable rain and surface water management policies and implementation e.g. rainwater attenuation and SuDS.</li> <li>SuDs e.g., infiltration trenches, soakways, swales, natural detention basins, geocellular storage systems, biosolar roofs, glue green roofs, pervious pavements, rain gardens.</li> <li>Rainwater harvesting - added benefit of reducing water consumption.</li> <li>Improving Blue/Green Infrastructure.</li> <li>Biodiversity protection and enhancement for wildlife to survive changes in climate.</li> <li>Air quality impact assessment to ensure buildings and services will not contribute to worsening vulnerability to photochemical smog.</li> <li>Building retrofits.</li> </ol>								
	Other adaptation measu	<ul> <li>7. Increase the quality and provision of green space and coverage in the Square Mile and wider City Corporation spaces.</li> <li>8. Introduce climate-resistant and adaptive landscaping.</li> <li>9. Enhancing monitoring, surveying and tracking of ecosystem health.</li> <li>10. Strengthen water quality monitoring networks.</li> <li>JITES 11. Mitigate impacts of extreme weather events in line with BREEAM Wst 05 requirements and in line with assessment criteria in BREEAM, with a focus on structural and fabric resilience when</li> </ul>								
		JITES       11. Mitigate impacts of extreme weather events in line with BREEAM Wst 05 requirements and in line with assessment criteria in BREEAM, with a focus on structural and fabric resilience when applicable.         12. Use of cool materials.       13. Solutions to protect utilities underground, reduces humidity levels within substation buildings.         14. Consider precipitation prevention measures including:       - Bio retention swales / rain gardens in open spaces and along wider streets, bio retention planters         -Temporary Detention Basins in hard surfaced areas       - Smart Underground rainwater harvesting water attenuation tanks         - Permeable surfacing and storage, oversized kerb drainage       1. Action to tackle food poverty.         2. Support mutual aid and community aid groups.       1. Action to tackle food poverty.								
	Community resilience	<ol> <li>Climate-ready, fortified public health programmes.</li> <li>Strengthen community and business networks to build adaptive capacity.</li> <li>Emergency support and contingency planning for food networks and businesses.</li> <li>Reduce vulnerability by empowering and engaging communities, supportive livelihoods and tackling health inequalities.</li> </ol>								
Climate Change		7. Cross-boundary and inter-agency working, particularly those to address flood risk, water scarcity and other climate risks with a close link to public health.								

BREEAM Tracker 23/06/23

**DRAFT** 



Pass

Adaptation		1. Develop financial package and programme to manage resilience actions.			
		<ol> <li>2. Embed principles of inclusion and equity throughout all climate action strategies.</li> <li>3. Mainstream climate resilience into City Corporation governance and decision-making.</li> </ol>			
		<ol> <li>Identify resilience risks to the Corporation's buildings.</li> <li>Public communications and awareness raising campaigns.</li> </ol>			
		<ol> <li>6. Strengthen City Corporation knowledge, skills and capacity.</li> <li>7. Emergency planning.</li> </ol>			
	Planning & management	<ol> <li>8. Continue to fund flood modelling.</li> <li>9. Develop urban heat vulnerability index and mitigation strategy.</li> </ol>			
		10. Review above and below ground space utilisation in the Square Mile. 11. Ports and markets operational resilience planning.			
		12. Establish research partnerships to inform future action planning and management of natural capital.			
		<ol> <li>13. Open a City Corporation Ecological Research and Education programme.</li> <li>14. Pest and disease horizon scanning, surveillance and research programme.</li> </ol>			
		<ol> <li>Model food supply networks through the Square Mile to inform future planning.</li> <li>Explore and facilitate opportunities to promote regional food production.</li> </ol>			
		<ul> <li>17. Review and expand data collection, monitoring and reporting.</li> <li>1. BREEAM Hea 04 – Thermal comfort; Thermal modelling to be carried out in accordance with BRE Hea 04 requirements.</li> </ul>			-
		2. The Building should be designed to limit the risk of overheating in accordance with adaptive comfort methodology such as CIBSE TM52 standards. 1. Promote occupants activity, comfort and well being by providing quality thermal comfort which reduces heat loss and energy usage.			-
		<ol> <li>Design alternatives for regularly occupied buildings (dependant on building type);</li> <li>         ■Cocalised active cooling or heating systems.     </li> </ol>			
		<ul> <li>Passive systems such as nightime air, wind flow.</li> <li>Individual thermal controls for at least 50% of individual occupant spaces and option to adjust air temp. radiant temp. air speed and humidity.</li> </ul>			
	Thermal Comfort and safety	<ol> <li>Incorporate mechanical cooling/other cooling in occupied spaces – strategies for this include:</li> <li>■Passive Ventilation.</li> </ol>			
		●❷perable Windows. ●Exterior/Interior Window Shading.			
		•Shade Structures. •Increased Insulation.			
		● ■igh Performance Windows and Facades.			
		<ul> <li>Bolar + Storage.</li> <li>Pleiling Fans</li> <li>1. Select materials and systems using climate change projections to design a heat resilient facility and reduce the risk of overheating such as;</li> </ul>			-
		<ul> <li>■ Bassive daylighting solutions.</li> <li>■ Bertically stacked double skin facades.</li> </ul>			
		•Exterior window shades.			
		<ul> <li>■ Binaded arcades.</li> <li>■ The set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set</li></ul>			
	Designing for heat resilience	•Thermally massive materials. 2. Optimise building layout by:			
		<ul> <li>Begregating temperature-sensitive electronics and computer control system from other systems.</li> <li>Palacing heat-generating equipment like transformers and switchgear outdoors, where permitted.</li> </ul>			
		<ul> <li>Identify heat-related points of failure and include design interventions such as ;</li> </ul>			
		<ul> <li>Belecting systems with higher heat tolerance.</li> <li>Adding Energy Recovery Ventilation systems.</li> </ul>			
		(House of Commons Environmental Audit Commitee, water quality in rivers fourth report)	One or more of the appropriate evidence types listed in the BREEAM Evidential requirements such as		
		1. Work to improve the quality of local water sources by monitoring pollutant levels, embedding SUDS in projects and reducing the use of pollutants during the construction, use and decommissioning of a site to improve local water quality. This will help to insure key freshwater species like Eels and Barbels are protected.	Design drawings and professional specialist reports		
	Water quality	(London sustainable drainage action plan & London Assembly at home with nature Encouraging biodiversity in new housing developments) 1. Protect diversity and encourage biodiversity by, where possible, including onsite green infrastructure such as water retention ponds and ensure all future buildings have sustainable measures			
		as part of normal practice. (London sustainable drainage action plan & London Assembly at home with nature Encouraging biodiversity in new housing developments)			
		1. Establish, where approproate site based treatment and recycling programs Requirements as per Water pollution and monitoring requirments within Pollution Minimisation		Image: Second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second se Image: Exact second second second second second second second second second second second second second second second second second second second second second second second second second second seco	
		(City of London Climte Action Strategy) 1. Introduce land management practices as per the Environment Bill, to show planners a 10% net gain in biodiversity will result before any project is green-lit - dependant on;	One or more of the appropriate evidence types listed in the BREEAM Evidential requirements such as Design drawings and professional specialist reports		
		<ul> <li>The site.</li> <li>Soil management.</li> </ul>			
		<ul> <li>Reducing the removal and re-deposition of soil on site.</li> <li>I non-planned paved areas to have sufficient soil depth and quality for growing vegetables.</li> </ul>			
	Dlanning	<ul> <li>On or off site tree planting and maximise the ability to remove carbon.</li> <li>Optimise biodiversity and resilience value.</li> </ul>			
	Planning	As per BREEAM Land Use & Ecology (LE) credits:			-
Biodiversity, ecology and	1	1. The client or contractor confirms compliance is monitored against all relevant UK and EU or international legislation relating to the ecology of the site. 2. The site is evaluated using the BREEAM Ecological Risk Evaluation Checklist, a Suitably Qualified Ecologist (SQE) carries out survey and evaluation to influence site preparation, works, layouts.			
conservation		3. Risks and feasibility of enhancement of the sites ecological value is included within the decisions made during site preparation, design and construction works. 4. A section on Ecology and Biodiversity has been included as part of the tenant or building owner information.			
		5. A landscape and ecology management plan or equivalent has been developed in accordance with BS 42020: 2020 Section 11.1.			
		1. Negative impacts from site preparation and construction works are managed according to the mitigation hierarchy and SQEs recommendations as outlined in BREEAM LEO3 credit. 2. (LEED) Protect or restore habitat – Preserve and protect from all development and construction activity 40% of greenfield area on the site (if exists).	One or more of the appropriate evidence types listed in the BREEAM Evidential requirements such as Design drawings and professional specialist reports		
	Mitigating risks	3. Restore a portion of the site identified as previously disturbed. 4. At least 75% of the proposed development is on previously occupied land, if the land is deemed contaminated, a contaminated land professional undertakes site investigation and confirms			
		that a remediation strategy will be implemented.			
		1. Change and enhance ecology by adopting locally relevant ecological measures from recognised local ecological expertise, in collaboration with representative stakeholders. 2. Positive change in ecological value (significant net gain) as a result of the project in accordance with BREEAM and HQM Ecology Calculation methodology.	Completed BREEAM and HQM Ecology Risk Evaluation Checklist		
		3. If unable to enhance ecology on site, include measures for the projects zone of influence.	A copy of the Ecological Survey and Evaluation document such as a Phase 1 habitat assessment.		
	Ecological change and	4. Adopt a Biodiversity strategy which incorporates tree planting to address both biodiversity and climate change concerns. This will include discouraging Landscaped areas requiring high irrigation, unless fed by rainwater or grey water collected on site to account for periods of drought due to climate risks. and selecting drought tolerant Species for window boxes .	Site visits confirming measures have been carried out in-practice in line with SQEs recommendations		
	enhancement	5. Implement an Urban Greening strategy; green roofs and green walls as appropriate. 6. Long term management and maintenance of ecology throughout the project has been implemented through input from the project team in collaboration with other stakeholders. Detailed	As-built evidence to show the changes in the BREEAM Change in Ecological value calculator have been carried out as planned in line with SQEs recommendations e.g. as built drawings, photos,SQE sign off.		
		management and maintenance plans are included within tenant or building owner information that encourages understanding and supportive behaviours.			
		1. Mitigate impacts of extreme weather events in line with BREEAM Wst 05 requirements and in line with assessment criteria in BREEAM, with a focus on structural and fabric resilience when applicable.	Embed resilience measures into our upgrade plans for our owned and operated buildings.		
	Planning and	<ol> <li>Avoid construction on high flood risk areas inline with LEED LT credit.</li> <li>Ensure compliance with the following CoLC Local Plan Policies:</li> </ol>	Embed a climate resilience lens into all our decision-making.		
	implementation	<ul> <li>Section 3.18.1 Core Strategic Policy CS18 : flood risk</li> <li>Policy DM 18.1 Development in the City Flood Risk Area</li> </ul>	Make the Square Mile public realm more climate change ready through adding in more green spaces, urban greening, flood resistant road surfaces, adaptable planting regimes and heat resistant materials.		
		<ul> <li>Policy DM 18.2 Sustainable Drainage Systems</li> <li>4. Sewer infrastructure design must allow for projected future sea level rise (SLR) increases in precipitation and frequency of high storm intensity.</li> </ul>	Reduce the risk of flooding through developing sustainable rain and surface water management policies,		
		(BREEAM Pol 03 Flood and surface water management) Ensure the following ;	resulting in a connected system of water recycling, sustainable urban draining and rainwater management measures.		
		<ul> <li>•BuDs are considered by all developers in new major developments and should, where possible, provide multifunctional benefits.</li> <li>•There is no discharge from the developed site for rainfall up to 5 mm (confirmed by the appropriate consultant).</li> </ul>			
		• Areas with a low risk source of watercourse pollution, an appropriate level of pollution prevention treatment is provided, using appropriate SuDS techniques. • Areas with a high risk of contamination or spillage of substances, such as petrol and oil, have separators (or an equivalent system) are installed in surface water drainage systems.			
		• Decomposition of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second			
	Flood and surface water	• All water pollution prevention systems have been designed and installed in accordance with the recommendations of documents such as the SuDS manual 2 and other relevant industry best			
	management	<ul> <li>A comprehensive and up to date drainage plan of the site will be made available for the building or site occupiers.</li> <li>Relevant maintenance agreements for the ownership, long term operation and maintenance of all specified SuDS must be in place.</li> </ul>			
		<ul> <li>All external storage and delivery areas are designed and detailed in accordance with the current best practice planning guidance.</li> </ul>			
		(BREEAM Pol 03 Flood and surface water management) To increase the resilience and resistance of the development to flooding ;			-
		1. The ground level of the building and access to both the building and the site, are designed (or zoned) so they are at least 600 mm above the design flood level of the site's flood zone (see 600 mm threshold).			
Flood resilience		2. The final design of the building and the wider site reflects the recommendations made by an appropriate consultant in accordance with the hierarchy approach outlined in section 5 of BS 8533:2017			
		Tree planting 1. Trees can be used as standalone features within soil-filled tree pits, tree planters or structural soils. Tree pits and planters can be designed to collect and attenuate runoff by providing			4.
		additional storage within the underlying structure (CoL Flood risk assessment, 2017). 2. It is crucial that tree species are chosen for their adaptability to the prevailing site conditions rather than a strict adherence to only native (City of Westminster, 2010).			Resilience
		<ol> <li>It is crucial that tree species are chosen for their adaptability to the prevaiing site conditions rather than a strict adherence to only native (City of Westminster, 2010).</li> <li>Bringing plants back where construction and high rates of urban growth have removed valuable eco-systems is key to creating sustainable comfortable cities, Urban greening will prevent climate events such as flooding and heat waves.</li> </ol>			
		Climate events such as flooding and heat waves. 1. Existing surfaces provide a surface suitable for pedestrian and/or vehicular traffic, while allowing rainwater to infiltrate through the surface and into underlying layers. 2. Specify surfaces with an aggregate sub-base to provide good water quality treatment before water is infiltrated to the ground, re-used, or discharged to a watercourse or other drainage			
		system. 1. Include a rainwater collection basin or a detention basin in the design and as part of the SuDS management system to help with attenuate runoffs and also to address all non-potable water			-
		consumptions (such as WC flushing) during construction and operation of the asset.			
	Decign	<ul> <li>2. Consider including the following water runoff storage and/or conveyance structures in the design as approperiate:</li> <li>Infiltration trenches to create temporary subsurface storage of stormwater runoff.</li> </ul>			
	Design	<ul> <li>Swales to store and/or convey runoff and remove pollutants.</li> <li>Soakaways to store or drain the water in large areas such as highways.</li> </ul>			
		<ul> <li>Natural Detention basins to remove pollution and reduce runoff downstream.</li> <li>Bule Green Roofs as a source-control feature</li> </ul>			
		• Green Roofs to intercept and retain precipitation, reducing the volume of runoff and attenuating peak flows.			-
		1. New developments must be constructed with separate down pipes for foul and surface water which will aid with conversion in the future should new surface water pipes be constructed within the City of London.			
		2. Site drainage should be designed inline with Thames Water recommendations should only be combined at the final manhole prior to leaving the site and entering the combined sewer.			

BREEAM Tracker 23/06/23

		1. Use methods and materials that reduce the impact from a flood, ensuring that structural integrity is maintained, and the drying out and cleaning required, following inundation and before reoccupation, is minimised.		
		2. Where flood resistance measures are not appropriate, enhance the features of the property so that they resist the ill-effects of flood water and dry out quickly and without permanent damage		
		1. BREEAM Tra 01 Transport assessment and Travel Plan - No later than Concept Design stage, undertake a site-specific transport assessment (or develop a travel statement) and draft travel plan, which can demonstrably be used to influence the site layout and built form.	Transport Assessment and Travel Plan	
		<ul> <li>2. This should include (where relevant)</li> <li>• Travel patterns and attitudes of existing building users towards sustainable transport methods (cycling, public transport)</li> </ul>	Marked up drawing showing cyclist facilities locations and details.	
		<ul> <li>Predicted travel patterns and transport impact of future building or site users</li> <li>Ourrent local environment for pedestrians and cyclists</li> </ul>	Confirmation including a formal commitment with targets set and tables / systems of monitoring and reporting energy and CO2 from site activities and transportation of materials and waste.	
		<ul> <li>Number of existing accessible amenities within 500m of the site</li> <li>Disabled access</li> </ul>	Confirmation of heating and hot water source / plant including specifications, drawings and	
		<ul> <li>Existing public transport index</li> <li>Ourrent facilities for cyclists</li> <li>A Pased on the transport assessment develop a travel plan that provides a long term management strategy which encourages more sustainable travel such as pegetiating with local bus, train or</li> </ul>	manufatcurers datasheets. Must show type, NOx emissions, VOCs and PM10 levels.	
		3. Based on the transport assessment develop a travel plan that provides a long term management strategy which encourages more sustainable travel such as negotiating with local bus, train or train companies to increase local provision, provision of EV charging stations for a minimum of 3kW for at least 10% of the total car parking capacity for the development, provision of parking capacity for the development assessment development.	Manufacturers datasheets / confirmations of VOC and formaldehyde and carcinogen levels of all finishes materials.	
	Transport	1. BREEAM Tra 02 – Provide Cyclist facilities based on the number of building occupants from the sliding scale of compliance, such as storage spaces, showers, lockers and changing facilities.	Air Quality Assessment	
		<ol> <li>During construction, where possible, use electric construction vehicles such as excavators, forklifts and loaders from local suppliers.</li> <li>Identify opportunities to purchase electric construction vehicles within the City of London to support with a Transition to a Zero Emission Fleet.</li> <li>Monitor and measure the transport of construction materials to minimise air quality impacts (BREEAM Man 03 Responsible Construction practices);</li> </ol>	Environmental Impact Assessment Screening Matrix checklist	
		•Ensure processes are in place to facilitate collecting and recording feedback from the community and to address any concerns related to the development footprint. •Assign responsibility to an individual for monitoring, recording and reporting transportation data resulting from all on-site construction processes (and dedicated off-site manufacturing)	Confirmation of the installation of air quality monitoring tools	
		throughout the build programme. •Report the total carbon dioxide emissions (total kgCO ₂ /project value) from the construction process via BREEAM Projects.	Site specific indoor air quality plan	
		<ol> <li>Set targets for transportation movements and impacts resulting from delivery of the majority of construction materials to site and construction waste from site. As a minimum cover:</li> <li>Transportation of materials from the point of supply to the building site, including any transport, intermediate storage and point of supply monitor as a minimum:</li> </ol>	Results from post construction on site VOC and formaldehyde testing.	
		<ul> <li>Materials used in major building elements.</li> <li>              Ground works and landscaping materials.      </li> </ul>		
		• Transportation of construction waste from the construction gate to waste disposal processing or recovery centre gate. This monitoring must cover the construction waste groups outlined in the project's resource management plan.		
		<ul> <li>4. Report separately for materials and waste, the total transport-related carbon dioxide emissions (kgCO₂-eq), plus total distance travelled (km).</li> <li>1. All heating and hot water is supplied by non-combustion systems. For example, only powered by electricity.</li> </ul>		
		If this cannot be met, ensure the below can be: • Ensure appliances installed align with the maximum NOx emissions levels for 2 credits under BREEAM Pol 02 including;		
	Nitrogen Oxides (NOx)	olas Boilers, Low and high pollution location – 24mg/kWh. old Boiler, low pollution location – 67mg/kWh, high pollution location – 50mg/kWh.		
		oBiomass and solid fossil fuel boiler, low pollution location 70mg/m3, high pollution location – 50mg/m3. oBas heat pump using external combustion, low pollution location – 30mg/kWh, high pollution location – 30mg/kWh. oDil heat pump using external or internal combustion/ gas and oil local space heaters/ biomass, solid fuel and wood pellets for closed fronted local space heaters, low pollution location –		
		70mg/kW/h_bigh pollution location – 50mg/kW/h 1. BREEAM Pol 02 local air quality – VOC and PM.		
		<ul> <li>2. Ensure appliances (mg/m3) installed align with the maximum VOC and PM10 emissions levels for 2 credits including;</li> <li> •Biomass boilers – Low pollution location, PM 11, VOC 5. High pollution location, PM 4, VOC 5 </li> <li> •Biomass boilers – Low pollution location, PM 11, VOC 5. High pollution location, PM 4, VOC 5 </li> </ul>		
Local air quality		<ul> <li>In the second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second sec</li></ul>		
		<ul> <li>■Biomass and solid fuel closed face local space neater - Low boliditon location. PM 25. VOC 25. Figh boliditon location. PM 10. VOC 10</li> <li>1. Ensure products align with the exemplary level Formaldehyde and TVOC emissions requirements for BREEAM ;</li> <li>■Interior paints and coatings; Formaldehyde ≤ 0.01 mg/m³, TVOS ≤ 0.3 mg/m³, TSVOC ≤ 0.1 mg/m³. Category 1A and 1B carcinogens; ≤ 0.001 mg/m³.</li> </ul>		
	Fine Particulate Matter	<ul> <li>• In the second products including wood flooring; Formaldehyde ≤ 0.02 mg/m³, TVOC ≤ 0.3 mg/m³, TVOS ≤ 0.1 mg/m³, Category 1A and 1B carcinogens; ≤ 0.001 mg/m³.</li> <li>• In the second products including floor level compounds and resin floor); Formaldehyde ≤ 0.01 mg/m³, TVOS ≤ 0.3 mg/m³, TVOS ≤ 0.1 mg/m³. Category 1A and 1B carcinogens; ≤ 0.001 mg/m³.</li> </ul>		
		<ul> <li>• Deciling, wall, acoustic and thermal insulation materials; Formaldehyde ≤ 0.01 mg/m³, TVOS ≤ 0.3 mg/m³, TSVOC ≤ 0.1 mg/m³. Category 1A and 1B carcinogens; ≤ 0.001 mg/m³.</li> <li>• Interior adhesive and sealants (including flooring adhesive); Formaldehyde ≤ 0.01 mg/m³, TVOS ≤ 0.3 mg/m³, TSVOC ≤ 0.1 mg/m³. Category 1A and 1B carcinogens; ≤ 0.001 mg/m³.</li> </ul>		
		1. Annual Average PM10 value of 20 μg/m ³ . 2. Development that would result in deterioration of the City's nitrogen dioxide or PM10 pollution levels will be resisted.		
		1. Annual Average PM2.5 value of 10μg/m ³ . 1. Undertake an annual assessment of air quality to ensure levels of nitrogen dioxide in 90% of the Square Mile meet health-based Limit Values and WHO Guidelines by 2025.		
	Air Quality Monitoring &	1. Developers are required to provide Air Quality Impact Assessments as applicable. 1. Option to follow EIA guidance; development plans may be required to conduct Environmental Impact Assessment Screening Matrix checklist surrounding the possible impacts of the proposed		
		development to air pollution. They may also need to consider: • What are the observed trends shown by recent air quality monitoring data and what would happen to these trends in light of proposed development and / or allocations.		
		eine potential cumulative impact of a number of smaller developments on air quality as well as the effect of more substantial developments, including their implications for vehicle emissions.		
		• Ways in which new developments could be made appropriate in locations where air quality is or is likely to be a concern, and not give rise to unacceptable risks from pollution. This could, for example, entail identifying measures for offsetting the impact on air quality arising from new development including supporting measures in an air quality action plan or low emissions strategy where applicable.		
		<ul> <li>         •         Øpportunities to improve air quality or mitigate impacts, such as through traffic and travel management and green infrastructure provision and enhancement.     </li> </ul>		
		1. (DEFRA Air Quality Monioring Methods) Identify, where possible the opportunity to include air quality monitoring tools to be installed at strategic locations in and around the project site such as those which have MCERTS certification.		
		1. BREEAM Hea 02 IAQ plan and Post construction indoor air quality measurement: Pre – occupancy • Produce a site specific indoor air quality plan to facilitate a process that leads to design, specification and installation decision around minimising indoor air pollution during occupation of the		
		building. The Indoor air quality plan must consider the following ; o Removal of contaminant sources.		
		o Dilution and control of contaminant sources. o Where present, consideration is given to the air quality requirements of specialist areas such as laboratories.		
	Indoor air quality	o Procedures for pre-occupancy flush out. o Third party testing and analysis.		
		o Maintaining good indoor air quality in-use. 2. Post Construction indoor air quality measurement.		
		• The formal dehyde concentration in indoor air is measured post construction (but pre-occupancy) and does not exceed 100µg/m ³ averaged over 30 minutes (World Health Organization guidelines for indoor air quality: Selected pollutants, 2010).		
		<ul> <li>•The formaldehyde sampling and analysis is performed in accordance with ISO 16000-2 and ISO 16000-3.</li> <li>•The total volatile organic compound (TVOC) concentration in indoor air is measured post construction (but pre-occupancy) and does not exceed 500µg/m³over 8 hours.</li> <li>•The TVOC sampling and analysis is performed in accordance with ISO 16000-5 and ISO 16000-6 or ISO 16017-1.</li> </ul>		
		• Where levels are found to exceed these limits, the project team confirms the measures that have, or will be, undertaken in accordance with the IAQ plan, to reduce the TVOC and formaldehyde 1. As a minimum, the passive design analysis should cover:	Passive design solutions integrated into the design development by the Architect	
		Site location. •Bite weather.	Passivhaus solutions integrated into the design development by the Architect Energy modelling and reporting	
		<ul> <li>Microclimate.</li> <li>Building layout.</li> </ul>		
		<ul> <li>Building form.</li> <li>Building form.</li> </ul>		
		<ul> <li>Building fabric.</li> <li>Thermal mass or other fabric thermal storage.</li> <li>Building occupancy type.</li> </ul>		
		<ul> <li>■Daylighting strategy.</li> <li>■ Intervention strategy.</li> </ul>		
	Analysis	1. Project team carries out an analysis of existing building fabric, form, site location and outline scheme design to influence decisions made during the Concept Design stage and identifies opportunities for the implementation of passive design solutions and retrofit measures that reduce energy demand.		
		2. Use passive design measures to reduce total heating, cooling, mechanical ventilation and lighting loads and energy consumtpion in line with results of passive design analysis. 3. Utilise passive HVAC strategies.		
		4. Provide direct exhaust airflow measurement device and automatic indication devices on all natural ventillation openings intended to meet the minimum opening requirements. 5. Highlight to developers the need for passive heat gain, resulting in smaller, simpler heating and hot water systems. E.g: Prioritise reduced fabric heat loss so that incidental room heat gains		
		can become primary heat source. 6. Ensure that design decisions reflect the energy hierarchy - seek to limit building energy demand through passive measures and efficient fabric design prior to considering systems'		
		optimisation to satisfy demand. 7. Integrate passive design features to mitigate cooling demand into proposals as outlined in the Energy Statement, these are to be applied and elaborated in the design development and		
		reserved matters stages, (in accordance with the Adaptive Pathways Implementation Plan). 8. In accordance with NYC Climate resilience design guidelines all efforts should be made to reduce the Urban Heat Island effect with a minimum of 50% of the projects site area to be shaded, vegaetated and/or high solar reflectance surfaces. As well as passive ventilation design and passive daylight solutions being consciously considered.		
Passive design		vegaetated and/or high solar reflectance surfaces. As well as passive ventilation design and passive daylight solutions being consciously considered.		
		Planning and assessments 1. Complete and document a site survey or assessment that includes heat island effect potential a Trade to identification of powing, shading, or reafing materials that can be included (LEED v4/1 Dwilding Design and Construction Site Assessment)		
		<ul> <li>• Leads to identification of paving, shading, or roofing materials that can be included. (LEED v4/1 Building Design and Construction Site Assessment).</li> <li>2. Identify key buildings at risk of contributing to the urban heat island.</li> <li>3. Evaluate sources of heat pollution that contribute to the Urban Heat island including developing strategies relating to:</li> </ul>		
		<ul> <li>3. Evaluate sources of heat pollution that contribute to the Urban Heat island including developing strategies relating to;</li> <li>Waste Heat recovery technology.</li> <li>Electric charging infrastructure for medium and heavy duty vehicles.</li> </ul>		
		• INVAC controls for intermittent ventilation (New York Design Guide) Roof measures:		
		LEED v4/1 Building Design and Construction Site Assessment 1. Use roofing materials that have an aged SRI equal to or greater than 64 (low sloped roof) and 32 (steep sloped roof).		
	Heat island effect	2. Install a vegetated roof. 3. Parking ; place a minimum of 75% of parking spaces under cover. The roof must have an fed SRI of at least 32, be a vegetated roof or be covered in energy generation systems.		
	Theat island effect			

BREEAM Tracker 23/06/23

		Non - roof measures 1. Use existing plant material or install plants that provide shade over paving areas within 10 years of planting. Can include vegetated planters and must be in place at the time of occupancy.			
		2. Provide shade by structures covered by energy generation systems such as PV and wind turbines - if on a roof is it should have an aged Solar reflectance value of at least 0.28 in accordance with ANSI/CRRC S100. If not on a roof or no information then the initial SR but be at least 0.33.			
		3. Provide shade with vegetated structures.			
		<ol> <li>Use paving materials with an initial SR of at lest 0.33.</li> <li>Use an open-grid pavement system (at least 50 % unbound).</li> </ol>			
		<ul> <li>6. A minimum of 50% of the projects site area shall be shade, vegetated and/or high solar reflectance surfaces.</li> <li>7. Lighter reflective surfaces such as light-coloured coatings, membranes and pavement materials.</li> </ul>			
		<ol> <li>8. Provision of trees to provide natura solar shading.</li> <li>9. Self standing structures such as canopies and shade sails to aid solar shading.</li> </ol>			
		10. Incorporate water bodies such as pools and fountains in the public realm to increase the cooling effect. 1. All efforts should be made to assist businesses and residents to reduce the amount of waste they produce and increase the proportion of waste they recycle.	Waste reduction techniques and initiatives		
	Waste	2. CoL committed to improve recycling opportunites in flats as 99% of the square mile is flats, by improving recycling this can contribute to 32% recycling rate by 2025. 1. Efforts should be made (through training, monitoring energy consuption and commissioning building services) to ensure that post occuancy EPC A or BREEAM Excellent ratings are not	Energy monitoring systems and commissioning reports		
	Energy	affected by the tenants- also ensure than tenants get involved and play an active part in improving said ratings. 2. Encouraging consumers to tariff switches such as the uptake of smart meters to help the widespread rollout of net zero technologies.	BREEAM In Use Assessment (optional)		
		3. Tackle fuel poverty by providing targeted energy efficiency measures and discounts on bills as highlighted within the Energy and Carbon Efficiency section. 1. Promote sustainable travel patterns & transport modes			
		<ol> <li>Improve conditions for pedestrians and cyclists through better management of the facilities</li> <li>All development proposals must be accompanied by an assessment of transport implications during construction &amp; operation, focusing on;</li> </ol>	Assessment of transport implications		
		<ul> <li>■ Road dangers</li> <li>■ Redestrian environment and movement</li> </ul>	Contractor pollution control methods and policies, including minimising light pollution		
		•@ycling infrastructure provision	Site investigation with risk assessment and remediation strategy		
	Travel/ Transport	<ul> <li>■ublic transport</li> <li>■The street network</li> </ul>	Climate resilient techniques		
Community engagement	+	oThis helps understand and mitigate the likely impact of the development on transport networks. 4. Loss of a pedestrian route will only be permitted where an alternative public pedestrian route of at least an equivalent standard is provided. Routes of historic importance should be			
		safeguarded. 5. Provide public access across private land where it enhances the connectivity, legibility and capacity of the City's street network.			
		<ol> <li>6. Create new pedestrian rights of way where this would improve movement and contribute to the character of an area.</li> <li>7. All off-street car parking spaces and servicing areas must be equipped with the facility to conveniently recharge electric vehicles.</li> </ol>			
		8. Designated parking must be provided for Blue Badge holders within developments. For domestic buildings, motorcycle parking must be provided at a ratio of 10 motor cycle parking spaces 1. Developers must consider minimising noise pollution arising from site acitivites. Where minimising is not possible, noise mititgation methods should be implemented e.g restricted operating			
		hours, noise attention methods. 2. Internal and external lighting should be designed to avoid spillage of light beyond what is needed to protect light-sensitive areas such as housing, hospitals, important areas of nature			
	Construction Impact	conservation.			
		3. Where ground work is required, developers must carry out a detailed site investigation to establish site contamination and undertake a risk assessment. Remediating sources of contamination which present an unacceptable risk must be carried out. 1. Local communities must be encourged and involved in order to effectively reduce the vulnerability of their area against the impact of climate change.			
	Climate resilience	2. There should be active engagement with tenant and occupiers on resilience issues.			
		<ol> <li>Consideration should be given to mitigation of health impacts where overheating may be an issue.</li> <li>Development should aim to improve occupant's internal environment and comfort.</li> </ol>			
		1. Smoke-free environment:	Air quality monitoring regime and testing results by Air Quality Consultant.		
		<ul> <li>Prohibited outdoor smoking at ground level within 7.5 meters of all building air intake.</li> <li>Signage is present to communicate the ban.</li> </ul>	Marked up drawings / photographs showing smoke free areas and signage, along with smoke free policies		
		<ul> <li>Prohibited outdoor smoking on decks, patios, balconies, roof tops and other occupied outdoor area above ground level.</li> <li>1. Ventilation Design - one of the following:</li> </ul>	agreed and adhered to.		
		<ul> <li>Mechanically ventilated spaces</li> <li>Newly installed ventilation systems are designed to meet one or more of 90% of the project area.</li> </ul>	M&E drawings, specifications, datasheets confirming ventilation strategy and monitoring, testing results, and confirmation of relevant / applicable standards met.		
		oASHRAE 62.1-2010 or any more recent versions (Ventilation Rate Procedure or IAQ Procedure). oASHRAE 62.2-2016.	Contractor confiormation of (as applicable):		
	Internal Environments		<ul> <li>sealed and proetcted ducts, and cleaning regime / confirmartion completed</li> <li>replacement of filters, and media filters with a PM10 removal rating</li> </ul>		
		o CIBSE Guide A: Environmental Design, version 2007 or any more recent version. 2. Existing ventilation systems have been tested and balanced to meet supply and exhaust rates set in one or more ventilation guidelines listed above within the last five years.	- moisture and dust management procedures		
		<ul> <li>3. Naturally ventilated spaces:</li> <li>•Newly installed ventilation systems are designed to meet one or more of 90% of the project area.</li> </ul>	Marked up drawing / schmatic showing labelled noise zones.		
		oNatural Ventilation Procedure in ASHRAE 62.1-2010 or any more recent versions. oEN 16798-1.	Marked up drawings / specifications / photos showing internal spaces with natural materials and planting or water fountain.		5
		oCIBSE AM10: Natural Ventilation in non domestic buildings. oAS 1668.4-2012 or any more recent version.	Confirmation / evidence of meeting the 'connection to place' requirements.		Wellbeing
		oAny reference above, which describes natural ventilation procedures. 4. Vents and windows used to meet the ventilation requirements in one of the standards mentioned above are permanently open or have controls to prevent their closure during periods of	Confirmation of universal design / accessibility including in design, policy and operations using drawings,		
		Construction Pollution Management: 1. For construction occurring after enrolment or the start of subscription, the following requirements are met:	specifications, photos, etc.		
		<ul> <li>Ducts are maintained per one of the below:</li> <li>ODucts are sealed and protected from possible contamination during construction.</li> </ul>			
		oDucts are cleaned prior to installing registers, grills and diffusers.			
	Construction	<ul> <li>2. If permanently installed ventilation system is operating during construction, filters must meet the following:</li> <li>Media filters with a PM10 removal rating of at least 70% (e.g., MERV 8) are used to filter return air.</li> </ul>			
		<ul> <li>•All filters are replaced prior to occupancy.</li> <li>3. The project implements the following moisture and dust management procedures:</li> </ul>			
		• Parpets, acoustical ceiling panels, fabric wall coverings, insulation, upholstery and furnishings and other absorptive materials are stored separately in a designated area protected from moisture damage.			
WELL Building type requirements		<ul> <li>All active areas of work are isolated from other spaces by sealed doorways or windows or using temporary barriers.</li> <li>Walk-off mats are used at entryways to reduce the transfer of dirt and pollutants.</li> </ul>			
		<ul> <li>I. The following requirements are met:</li> <li>         • An annotated document is submitted and made available to occupants showing labelled zones throughout the project floor plan or similar schematic document as follows:     </li> </ul>			
	Noise	oLoud zones: includes areas intended for loud equipment or activities (e.g., mechanical rooms, kitchens, fitness rooms, social spaces, recreational rooms, music rooms).			
	Noise	oQuiet zones: includes areas intended for concentration, wellness, rest, study and/or privacy (e.g., restorative spaces, lactation rooms, nap rooms). oMixed zones: includes areas intended for learning, collaboration and/or presentation (e.g., auditoriums, classrooms, breakout spaces).			
		oCirculation zones: includes occupiable areas not intended for regular occupancy (e.g., hallways, egress, atria, stairs, lobbies). 2. If Loud zones directly border Ouiet zones, projects provide a plan for reprogramming or mitigating sound transmission between Loud zones and Ouiet zones. Provide connection to nature:			
		1. The project integrates the following throughout the space, including common circulation routes, shared seatings, and rooms:			
		<ul> <li>Natural Materials, patterns, shapes, colours, images or sounds.</li> <li>One of the following:</li> <li>Oplants or go notted plants, planted walls OP</li> </ul>			
	Mind	oPlants e.g., potted plants, planted walls OR oWater e.g., fountain.			
		Provide connection to place: 1. The project integrates design elements that address the following:			
		<ul> <li>Delebration of culture e.g., culture of occupants, workplace, surrounding communities.</li> <li>Delebration of place e.g., local architecture, materials, flora, artists.</li> </ul>			
		Integrate universal design: 1. The project considers best practices in universal design to accommodate a diverse range of occupant abilities and needs throughout the project, by implementing at minimum one design,			
		operations or policy strategy in each of the following categories: • Physical access: entry, exit and key interaction points that enable inclusive entrance and strategies that enable flexible usability of the space to accommodate change as needed.			
		• Developmental and intellectual health: strategies that use colour, texture, images and other multi-sensory visually perceptible information (e.g., to accommodate sensory requirements of neurodiverse individuals).			
	Accessibility	<ul> <li>Wayfinding: strategies that help individuals intuitively navigate through the project (e.g., signage, tactile maps, symbols, auditory cues, information systems).</li> <li>Operations: operational policies and programs that support inclusion and accommodate a diverse range of needs (e.g., diversity and inclusion training, flexible work hours for individuals with</li> </ul>			
		disabilities). • The chnology: technology (e.g., audio and visual equipment, web access) that helps individuals fully utilise a space (e.g., to assist blind or deaf individuals, or those who do not speak the native			
		<ul> <li>Indentify the molegy (e.g., duals and visual equipment, web decess) that helps marked us fully duals a space (e.g., to assist blind of dear markedus, of those who do not speak the native language), made available to all occupants at no cost.</li> <li>Indentify a space (e.g., to assist blind of dear markedus, of the native language), made available to all occupants at no cost.</li> <li>Indentify a space (e.g., to assist blind of dear markedus, of the native language), made available to all occupants at no cost.</li> <li>Indentify a space (e.g., to assist blind of dear markedus, of the native language), made available to all occupants at no cost.</li> <li>Indentify a space (e.g., to assist blind of dear markedus, of the native language), made available to all occupants at no cost.</li> <li>Indentify a space (e.g., to assist blind of dear markedus, of the native language), made available to all occupants at no cost.</li> <li>Indentify a space (e.g., to assist blind of dear markedus, of the native language), made available to all occupants at no cost.</li> <li>Indentify a space (e.g., to assist blind of dear markedus), of the native language (e.g., to assist blind of dear markedus), of the native language (e.g., to assist blind of dear markedus), of the native language (e.g., to assist blind of dear markedus), of the native language (e.g., to assist blind of dear markedus), of the native language (e.g., to assist blind of dear markedus), of the native language (e.g., to assist blind of dear markedus), of the native language (e.g., to assist blind of dear markedus), of the native language (e.g., to assist blind of dear markedus), of the native language (e.g., to assist blind of dear markedus), of the native language (e.g., to assist blind of dear markedus), of the native language (e.g., to assist blind of dear markedus), of the native language (e.g., to assist blind of dear markedus), of the native language (e.g., to assist blind of dear markedus), of the native language (e.g</li></ul>			
Embodied carbon Operational energy and	Embodied carbon Post Occupancy	Please see sub-category above         Please see sub-category above	Please see sub-category above         Please see sub-category above		
carbon	performance	1. Appropriate energy monitoring and management systems are installed for the various end-use categories of energy consuming systems.	Schematics, drawings, specifications confirming metering strategy, along with the monitoring and		
	Energy Monitoring	2. Separate landlord and tenant energy use meters and clearly label meters with serial number and end use.	Schematics, drawings, specifications confirming metering strategy, along with the monitoring and management systems.		
	Water Monitoring	3. Use a central repository for data that has a minimum of 18 months data storage. 1. Water-consuming plant or building areas, are either fitted with easily accessible pulsed or digital sub-meters or have water monitoring equipment integral to the plant or area.	Confirmation of energy use data disclosure, reporting startegy.		
		■ 1. Disclose energy use data (residential) including: ■©ollect annual building energy consumption and generation.	Confirmation of data upload to Carbon Buzz or GLA.		6. Post
Energy and water		<ul> <li>Collect annual building energy consumption and generation.</li> <li>Aggregate average operational reporting e.g. by post code for anonymity or upstream meters.</li> <li>Collect water consumption meter readings</li> </ul>	Copy of DEC		Occupancy Evaluation
monitoring	Data Disclosure	<ul> <li>Collect water consumption meter readings.</li> <li>Delta five years of data to GLA and/or CarbonBuzz online platform.</li> </ul>			(POE)
		•Ronsider uploading to Low Energy Building Database. 1. Disclose energy use data (commercial / Public) including: •Rarry out an annual Display Energy Certificate (DEC) and include as part of annual reporting.			
		<ul> <li>• Parry out an annual Display Energy Certificate (DEC) and include as part of annual reporting.</li> <li>• Report energy consumption by fuel type and respective benchmarks from the DEC technical table.</li> <li>• Report energy consumption of figure produce energy (been building) reting and tapant retings as well as an instead of a whole building DEC.</li> </ul>			
1		<ul> <li>Image: Provide the second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second secon</li></ul>			
Local air quality			Please see sub-category above		
Local air quality WELL requirements	Local air quality WELL requirements	Please see sub-category above	Please see sub-category above         Please see sub-category above		

BREEAM Tracker 23/06/23

Arcadis

Page 507

Arcadis

BREEAM Tracker 23/06/23

This page is intentionally left blank

Committee(s)	Dated:
Operational Property & Projects Sub Committee –	3 rd July 2023
For Information Subject:	Public
Cyclical Works Programme 2022/23 Outturn report	
Which outcomes in the City Corporation's	Shape outstanding Environments
Corporate Plan does this proposal aim to	<ul> <li>– Our spaces are secure, resilient,</li> </ul>
impact directly?	and well-maintained
Does this proposal require extra revenue	No
and/or capital spending?	
If so, how much?	£N/A
What is the source of Funding?	N/A
Has this Funding Source been agreed with the	Yes
Chamberlain's Department?	
Report of:	For Information
The City Surveyor report ref CS 186/23	
Report author:	
Jonathan Cooper, City Surveyor's Department	

#### Summary

This report outlines the cyclical works programme (CWP) financial outturn against fund (City's Cash, City Fund and Guildhall) and against location type (Corporate, Guildhall School for Music & Drama, Heritage Assets, Open Spaces, and the Barbican).

Each delivery department is asked to forecast delivery of their projects, this provides a forecast expenditure against each of the agreed programmes.

The latest budget for CWP works to be delivered within 22/23 totalled c.£13.05million. The outturn of actual expenditure was £10.54million which equated to c.80.7% of the budget. A further £3.24million was committed against programmed projects, which if considered, brings this to 105% of the budget. These committed projects will be completed within the 2023/24 programme year, many are already complete.

Recently agreed changes in the way the CWP is agreed will be integral in achieving higher and more accurate in-year spend levels. Specifically, where collective programmes can be agreed in advance, the delivery departments will be able to collaborate with partnering Contractors to resource and programme works more efficiently. This will result in more accurate forecasting, potential savings over the programme and the appropriate resource to deliver the programme.

# Recommendations

Members are asked to:

- 1. Note the progress of current CWP programmes of work.
- 2. Note that RASC have approved the underspend on all existing projects to be carried forward and completed in 23/24.

# Main Report

- 1. There are many factors that has impacted the achievable spend in the programme. Specifically:
- Annual approval timings of programme budget, meaning that that preconstruction activities cannot progress until budget is available – usually in the April of the new programme year. This has a significant impact on projects reliant on summer or recess shutdowns. E.g., at the GSMD, Barbican, on heritage projects and parts of the Guildhall.
- Projects achieving savings against the budget. E.g., where a more costeffective solution can be derived.
- Projects unable to complete due to operational or stakeholder constraints. This is particularly prevalent in high profile buildings such as the Barbican.
- 2. The impacts are widely acknowledged, and strategies are in places to address the issues. Key contributing factors to addressing this will be:
  - a. Approval by this committee of collective 3-year programmes rather than singular year programmes – such as that proposed as part of the backlog paper received by this committee in April this year. This will enable departments to appropriately plan and resource projects over a more operationally achievable period.
  - b. To support this delivery approach, newly procured measured term contracts will enable delivery teams to have more engagement with Contractors and the ability to appoint them for both project management and specialist design where applicable. This will mitigate any departmental resource issues.
- 3. In October 2022, budget forecasts were revised between departments to pick up a reduced programme forecast at the Barbican & GSMD. The aim was to realign the programme with the expectation of spending as much of the budget within the fiscal year. An overview of the CWP planning and governance is included in appendix 1.
- 4. The table below outlines overall programme performance, broken down to fund type. Note that budget is not the total budget allocated, but the forecast expenditure against the programme budget for 22/23.

Programme	Original Budget	Revised* Budget	Actual	% Spent	Balance	Committed	Total Spent/Committed	Actual & Commited / Budget
City Fund	2,756,000	2,540,000	2,058,767	74.70%	697,233	1,124,906	3,183,673	115.52%
Barbican	3,344,000	2,635,000	2,335,642	69.85%	1,008,358	403,730	2,739,372	81.92%
Citys Cash	3,818,000	4,481,000	3,052,053	79.94%	765,947	1,119,964	4,172,017	109.27%
GSMD	1,889,000	1,500,000	1,232,312	65.24%	656,688	259,707	1,492,019	78.98%
Guildhall Admin	1,243,000	1,977,000	1,856,873	149.39%	-613,873	331,331	2,188,204	176.04%
	13,050,000	13,133,000	10,535,647	80.73%	2,514,353	3,239,638	13,775,285	105.56%

	Table 1 – Total	programme expenditure for the 22/23 fiscal year by fun	١d
--	-----------------	--------------------------------------------------------	----

*There was no revised estimate submitted to committee in 22/23

- 5. A notable change to the 2022/23 CWP bid was the blanket approval of sub-£10k projects. These were able to be packaged up and delivered in a much more efficient manner by various contractors e.g., our previous FM Contractors - Skanska. These savings were then distributed to new projects. Given the savings would not have been realised until later in the fiscal year it gave little time in which to deliver the project, hence many of the committed sums will have been new projects that had not finished.
- 6. The biggest underspend was in City Fund, with over half of this underspend relating to Barbican, Planning & Transportation and Port Health. This is due to a mixture of some larger projects being delayed and cumulative savings on smaller projects (many of these being sub £10k projects). The larger projects were still committed, and many new projects were developed in the open spaces as part of the savings made.
- 7. A full breakdown per asset area is provided in appendix 2. It is noted that some asset areas have overspent against the in-year area budget, this was agreed with the Chamberlain via the Peer Review Group and helped to reduce the overall programme underspend against each area.
- 8. Table 2 outlines the portion of each previous CWP and level of committed spend at the end of 2022/23 fiscal year.

Programme award year	Budget	Actual	% Spent	Balance	Committed	Actual & Committed / Budget
2022-23	4,407,000	3,643,042	82.66%	763,958	1,833,977	124.28%
2021-22	1,797,000	1,197,111	66.62%	599,889	208,326	78.21%
2020-21	4,872,000	3,265,192	67.02%	1,606,808	663,890	80.65%
2019-20	1,974,000	2,317,184	117.39%	-343,184	404,884	137.90%
Older	0	113,119	0.00%	-113,119	128,560	0.00%
	13,050,000	10,535,647	80.73%	2,514,353	3,239,638	105.56%

Table 2 – Total programme expenditure for the 22/23 FY split by yearly programme

Programme award year	Budget	Total	% Spent	Balance	Committed	Actual & Committed / Budget
City Fund	6,100,000	4,394,408	72.04%	1,705,592	1,528,636	97.10%
City's Cash	5,707,000	4,284,343	75.07%	1,422,657	1,379,671	99.25%
Guildhall Admin	1,243,000	1,856,895	149.39%	-613,895	331,331	176.04%
	13,050,000	10,535,647	80.73%	2,514,353	3,239,638	105.56%

# **Corporate & Strategic Implications**

- 1. Cyclical Works Programmes set out to deliver three of the key objectives in the Corporate Property Asset Management Strategy.
- SO.1 Operational assets remain in a good, safe, and statutory compliant condition.
- SO.2 Operational assets are fit for purpose and meet service delivery needs.
- SO.3 Capital and supplementary revenue programmes are affordable, sustainable, and prudent and that the limited available resources are directed to the highest corporate priorities.

# Conclusion

11. There are several factors which have contributed to the reduced performance against actual expenditure. It is positive that the total committed expenditure means that projects will, at this stage, either be on site or nearing completion.

Where higher priority projects have been delayed, project managers have worked with the local Facilities Manager to mitigate and address any compliance, statutory or operational risk.

Various cost savings have been sought from many projects, these savings have been returned to the central funding pot and have been diverted to high scoring projects that may not have had previous funding. This will reduce funding pressures on future works programmes and enable the City Surveyor to address high priority maintenance projects across the corporate portfolio.

# Appendices

Appendix 1 – Overview of Cyclical Works Programme (CWP) Appendix 2 – CWP Summary by area 22-23

# **Report Author**

Jonathan Cooper Assistant Director - City Surveyor's Department T: 07903 945152 E: jonathan.cooper@cityoflondon.gov.uk

#### Appendix 1 - CWP Carry Forward Report

# **Overview of Cyclical Works Programme (CWP)**

A programme, made up of many individual projects, across City Fund and City Cash portfolios is agreed in each financial year. As an example, the 22/23 programme consists of over 180 projects totalling over £11million. The future 23/24 bid will be submitted to this committee later this year.

Previous programmes had been given several years in which to spend the programme budget, this enabled project managers to align delivery with the operational constraints of each of the portfolio types and to factor in stringent Heritage/Conservation requirements. Where projects make savings, the balance is returned to the 'central CWP programme budget'. This provides an opportunity for the funds to be reallocated to other projects that require funding and potentially address backlog maintenance issues across the asset portfolios.

Traditionally, CWP works programmes were expected to be spent within 3 years from their approval year, more recently this has been reduced to 2 years.

There is need to conduct planned refurbishment and replacement of buildings and their associated equipment in addition to routine serving and repairs. Resources being limited, such works need to be prioritised across the entire corporate operational estate. The Cyclical Works Programmes consider the requirements of each and prioritises individual projects in the context of the whole to ensure that the City's overall property maintenance objectives are met.

- The CWP is overseen by the City Surveyor's department who undertake most of the project delivery, however projects undertaken by the Barbican and Guildhall School and the engineering projects for the Department of the Built Environment (DBE) are delivered by their own teams and so are accountable for their element of project delivery not the City Surveyors' Department.
- 2. The Peer Review Group, chaired by the Chamberlain, has authority to agree reallocation of funds between existing projects and to divert funds to new projects that meet a jointly agreed criterion. These changes are made within the agreed programme funding envelope. This ensures that project issues can be dealt with promptly and has the potential to reduce the backlog of maintenance (bow-wave) where projects can be brought forward.

	Original Budget	* Revised Budget	Actual	Variance Original / Actual	Actual / Original	Commitments
Reference	£	£	£	£	%	£
BARBICAN	3,344,000	2,635,000	2,335,642	1,008,358	69.85%	403,730
GSMD	1,889,000	1,500,000	1,232,312	656,688	65.24%	259,707
	5,233,000	4,135,000	3,567,954	1,665,046	68%	663,437
	54.000	075 000	4.40,000	04.000	000 000/	00.010
BUNHILL FIELDS	51,000	375,000 50,000	142,996	-91,996	280.38%	92,619
CEREMONIAL EPPING & COMMONS	0 914,000	850,000	66,081 641,619	-66,081 272,381	0.00% 70.20%	69,599 322,084
HAMPSTEAD	770,000	975,000	580,633	189,367	75.41%	210,993
KEATS	48,000	123,000	70,195	-22,195	146.24%	55,254
MAGISTRATES COURT	129,000	230,000	269,578	-140,578	208.98%	49,392
MANSION HOUSE	827,000	268,000	179,107	647,893	21.66%	53,497
MAYORALTY	10,000	10,000	7,986	2,014	79.86%	0
MONUMENT	28,000	28,000	15,968	12,032	57.03%	0
QUEENS PARK & H WOOD	157,000	282,000	164,520	-7,520	104.79%	34,024
SMITHFIELD	765,000	1,155,000	802,959	-37,959	104.96%	232,381
WEST HAM PARK	119,000	135,000	110,411	8,589	92.78%	122
	3,818,000	4,481,000	3,052,053	765,947	80%	1,119,965
BATH HOUSE	13,000	3,000	4,803	8,197	36.95%	0
CENTRAL CRIMINAL	673,000	605,000	465,950	207,050	69.23%	57,977
CF OPEN SPACES	73,000	82,000	96,815	-23,815	132.62%	0
INFORMATION CENTRE	22,000	29,000	34,511	-12,511	156.87%	0
LIBRARIES	466,000	454,000	378,620	87,380	81.25%	207,443
MAYOR'S COURT	20,000	95,000	126,580	-106,580	632.90%	0
PLANNING & TRANSPORT	760,000	386,000	336,749	423,251	44.31%	678,927
PORT HEALTH	684,000	537,000	368,114	315,886	53.82%	137,042
WALBROOK	45,000	349,000	246,274	-201,274	547.28%	43,517
RECREATIONAL	0	0	350	-350	0.00%	
	2,756,000	2,540,000	2,058,766	697,234	74.70%	1,124,906
GUILDHALL	1,243,000	1,977,000	1,856,873	-613,873	149.39%	331,331
	1,243,000	1,977,000	1,856,873	-613,873	149.39%	331,331
Grand Total	13,050,000	13 133 000	10,535,646	2 514 354	80.73%	3,239,639
	13,030,000	13,133,000	10,555,040	2,514,354	00.73%	3,233,039

# Agenda Item 13

Committee(s)	Dated:
Operational Property and Projects Sub Committee	3 rd July 2023
Subject: 22/23 Energy & Decarbonisation Performance Q3 Update for the Operational Portfolio.	
Which outcomes in the City Corporation's Corporate Plan does this proposal aim to impact directly?	5,11,12
Does this proposal require extra revenue and/or capital spending?	no
If so, how much?	n/a
What is the source of Funding?	n/a
Has this Funding Source been agreed with the Chamberlain's Department?	No
Report of: The City Surveyor	For Information
Report author: Graeme Low	

# Summary

This report presents the 2022/23 Quarter 4 energy performance for City of London Corporation operational sites. There has been an 19% reduction in energy usage since the 2018/19 baseline year and we remain on track to achieve our net zero carbon targets by 2027. The first phase of our capital programme has been approved and we are now developing the projects towards installation in 2023. Energy prices are softening due to market forces and the Power Purchase Agreement (PPA).

# Recommendation(s)

- Note, that for the rolling year, Q4 22/23 weather corrected energy consumption has reduced by 17% compared to the baseline year 2018/19.
- Note the recent acquisition of Local Energy Accelerator funds totalling £80k to support an investigative project for Guildhall battery storage and Barbican Estate Electrical Flexibility.
- Note the Public Sector Decarbonisation Scheme (PSDS) funded work is complete and the savings are now being monitored and verified.

# Main report

# Background

- At OPPSC on 6th March 2023 the 22/23 Q3 Energy performance report was presented. This identified the rolling 12-month energy performance to an 18% improvement on the weather corrected values for the Climate Action Baseline year of 2018/19. This saving was due to site disposals, active management of the Building Energy Management System (BEMS) by the Energy Team and ongoing success of the Public Sector Decarbonisation Scheme (PSDS) project, both of which are summarised in this report.
- 2. The Climate Action Strategy (CAS) year 3 plans have been approved by Policy and Resources Committee. They include the NZ1 plan which is specifically focused on reducing the carbon emissions within the City Corporation's own estate through a range of tasks including: capital works projects, building control improvements, and monitoring and targeting activities.

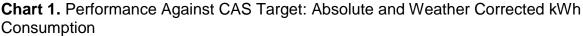
# **CAS** target alignment

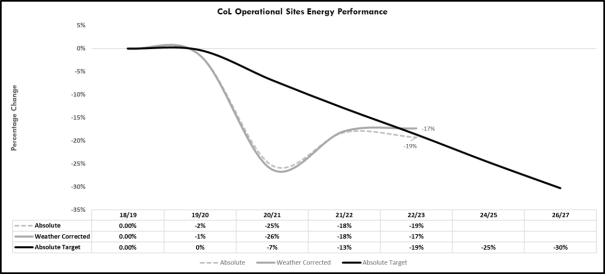
- 3. The Energy Team and CAS Programme Team use best practise methodologies for reporting KPIs and measuring progress against our Net Zero Carbon (NZC) targets. The CAS buildings baseline includes operational property portfolio, landlord supplies to housing estates and investment properties.
- 4. To achieve Net Zero CO₂ target by 2027 for our scope 1 and 2 operational emissions, residual emissions are planned to be mitigated via land-based carbon sequestration from our green spaces. These targets are translated into energy and CO₂e, see Chart 1 and Chart 2 below.

# **Current position**

5. There has been a gradual increase in consumption compared to the previous quarter due to the return to normal operations and greater occupation and use of our buildings. The impact of PSDS energy saving projects will not be fully realised until Q4 23/24, though a high percentage of the related savings are being accounted for in these figures. The City Corporation continues to support investment in energy and carbon saving projects through the recently approved gateway 2 paper focusing on the top 15 energy consuming sites. This is expected to provide an additional 520 tonnes of CO2e savings per annum across our scope 1 and 2 emissions.

# Performance update



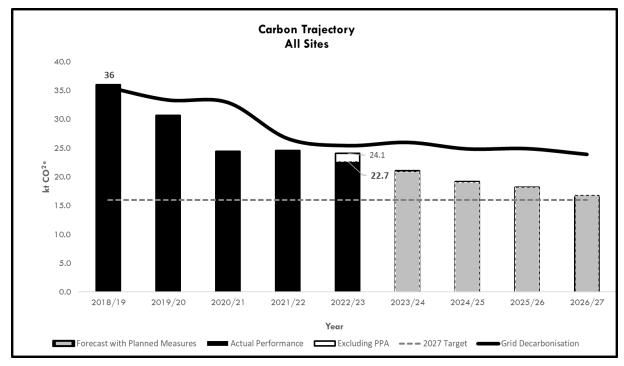


- Long term: Chart 1 presents updated operational building targets to reflect 2018/2019 baseline data in conjunction with the Climate Action Strategy (CAS). It shows continued progress towards the interim target. Compared to the 2018/2019 baseline, the performance up to Q4 2022/2023 indicates:
  - a. A 19% reduction in absolute energy consumption
  - b. A 17% reduction when corrected for the weather

A comparison of rolling year energy performance for the operational properties Q4 2022/23 and Q4 2021/2022 shows an increase in weather corrected values by 1%. This figure excludes the benefit of the PPA. This was expected as we continue a return to normal mode of operations. Further details can be found in table 1 of the appendix.

**Chart 2. Carbon Trajectory** presents progress towards the 2027 carbon target for the Corporation's portfolio and shows:

a. A saving of 13,333 tonnes of CO_{2e} or a 37% reduction from 2018/2019, based on the last full financial year figures (2022/23). Note this figure includes the impact of the PPA.



The following provides a synopsis of Chart 2:

- 7. The savings since 2018/19 demonstrate a positive trajectory for the Climate Action Strategy 2027 Net Zero Carbon target. Completion of the PSDS projects (table 4 of Appendix) will support continued reduction of emissions. The PPA has contributed to reduced carbon emissions, as demonstrated by the white bar with the black outline. Carbon emissions for the financial year 22/23 would have been 24.1 kt CO2e without the PPA.
- 8. Item 8 of the appendix provides an overview of the Operational property carbon performance, without landlord emissions for Housing and IPG portfolios. This currently shows 15.5 KtCO₂e of emissions, a reduction of 6.6 KtCO₂e or 30% since 2018/19. This keeps the Operational property portfolio on track to support the City Corporation's net zero carbon targets for 2026/27.

Top 5 Best Performing Sites Weather Corrected	Mar-22	Mar-23	Difference kWh 23 vs 22
Guildhall Complex	14,319,976	13,041,092	- 1,278,884
Central Criminal Court	6,624,980	5,568,390	- 1,056,590
Mansion House	2,250,048	1,725,984	- 524,064
Open Spaces Golders Hill &	454,447	239,749	- 214,698
GSMD - Sundial Court	1,648,327	1,450,305	- 198,022

# Table 1. Overall performance Q4 Top 5 sites – weather corrected

Bottom 5 Performing Sites Weather Corrected	Mar-22	Mar-23	Difference kWh 23 vs 22
Barbican Arts Centre	15,004,662	16,609,177	1,604,515
London Central Market (Smithfield)	10,491,520	11,433,828	942,307
Bishopsgate Police Station	2,769,529	3,453,913	684,384
City of London Freemen's School	4,586,124	4,940,940	354,816
Tower Bridge	2,015,186	2,325,066	309,880

Table 2: Overall performance Q4 bottom 5 sites - weather corrected

- 9. Table 2 above provides a snapshot of the highest energy reductions and the greatest increases within the top thirty buildings over the past 12 months to 31st March 2023, when compared to the previous 12 months. The full list of the top thirty site performance and performance overview for bottom five increases can be found within table 1 of the Appendix.
- 10. The top sites have continued to show a reduction due to improved controls and implementation of energy saving measures. Descriptions can be found in the Appendix.
- 11. The bottom sites have seen increases in heating demand and occupancy levels, increased refurbishment activities as well as possible maintenance issues. Metering issues within the portfolio, including the Barbican Arts Centre, have resulted in the use of estimated data which could negatively impact on their reported performance. The energy team continue to collaborate with these sites to optimise their performance. Further information can be found in the Appendix.

# Progress on energy projects

- 12. **PSDS Project:** In 2021 the City Corporation were awarded £9.5m of government grant funding through the Public Sector Decarbonisation Scheme (PSDS) to deliver a range of energy efficiency works across Guildhall, Barbican Arts Centre, Guildhall School of Music and Drama, London Metropolitan Archives and Walbrook Wharf. The scope of works included lighting upgrades, ventilation upgrades, building control upgrades and improvements, submetering, new energy management and building analytics software. These works are now complete. Verification of the savings is expected at gateway 6 in Q4.
- 13. **CAS Capital Programme**: NZ1 of the Climate Action Strategy includes for the development and delivery of a capital works programme to invest in carbon saving projects across the scope 1 and 2 emissions within our buildings. In December 2022 Policy and Resources Committee approved a Gateway 2 paper setting out a programme of projects across our operational portfolio. The total capital cost is estimated at £5,338,615 (excluding risk) and is targeting savings of 520 tCO₂/annum and energy cost saving of £550,000 per annum. The Energy Team are currently developing the first projects to Gateway 5 by June 2023 and aim to have the first projects completed by December 2023.

- 14. **BEMS**: Improved control of our energy usage through Building Energy Management System (BEMS) within buildings has played a key role in improving operational energy efficiency, supported further through the deployment of a new Building Analytics Platform at the Guildhall and LMA with a further roll-out of the software to CCC and Mansion House in the next two months. The transition of the BEMS to a new platform has continued with projects due to for completion shortly at LMA, Walbrook Wharf, Tower Bridge and Guildhall East Wing and Smithfield West Market. These projects are enablers for further energy efficiency projects at these sites. The management of the BEMS maintenance contract is now under the remit of the Energy Team, this allows for better service provision with a focus on identification and implementation energy efficiency opportunities and measures via the BEMS. Outside of this the energy team continue to review and optimise plant control on various sites, with the savings to be reported via the NZ Intervention Management Plan.
- 15. **PPA**: The PPA contract with Voltalia UK ltd. is now complete and fully operational January 2023. The PPA will provide over 60% of our electricity at £42.89 MWh in 23/24 compared to the current market rates for electricity of ~£320MWh at current rates.
- 16. Battery storage: The Energy and Sustainability Team have recently been awarded a £80k grant towards reviewing the options for battery storage and flexibility services at the Guildhall and Barbican Estate. The study aims to provide detailed information about options and benefits in relation to the delivery of flexibility services to support energy security and will conclude in July 2023.

# **Corporate and strategic implications**

- 17. **Strategic implications:** Energy performance is linked to resilience and helps ensure business continuity through reduced pressure on the energy infrastructure within the square mile. We support a thriving economy through ensuring environmental responsibility in this way. Our energy performance helps to shape outstanding environments through the reduction of CO_{2e} emissions and our commitment to procuring clean renewable energy. In this way our energy performance helps shape outcomes 5, 11 and 12 of the Corporate Plan.
- 18. Financial implications: The savings in this report detail reductions in energy consumption and not against agreed budgets. For longer sustainable gains the focus needs to be on improving efficient use of energy, through targeted investment in energy saving measures. Note that future savings as a result of lower energy spend related to the PSDS project will be transferred to the Build Back Better fund for re-investment with further projects.

# Conclusion

19. The energy performance within Q4 remains on track with the long-term trajectory needed to meet our CAS targets for 2027. We continue to mobilise workstream (NZ1) related to operational buildings within the Climate Action Strategy. We have absorbed the impact of the reoccupation of our building stock. Our new targets are challenging but the current data indicates achievable, requiring action in all areas of the City Corporation to ensure we meet our planned objectives. Our focus is now on ensuring the next phase of climate action projects can be implemented in a timely and effective manner.

# Report author

# Emma Bushell

Energy and Carbon, City Surveyor's Department emma.bushell@cityoflondon.gov.uk

This page is intentionally left blank

# Appendix

# 1. Top 30 site energy performance and bottom 5 performance overview

Weather Corrected Data: Performance comparison by top 30 sites: Q4 2022/23

Row Labels	T Sum of Mar-19	Sum of Mar-22	Sum of Mar-23	Sum of kWh Difference 23 vs 22
Animal Reception Centre	746,890	747,981	717,364	- 30,618
Barbican Arts Centre	17,469,734	15,004,662	16,609,177	1,604,515
Baynard House Car Park	165,216	151,024	166,202	15,178
Billingsgate Market	3,579,617	3,461,594	3,275,526	- 186,068
Bishopsgate Police Station	3,408,990	2,769,529	3,453,913	684,384
Central Criminal Court	7,825,308	6,624,980	5,568,390	- 1,056,590
City of London Crematorium	2,788,975	2,292,229	2,324,161	31,932
City of London Freemen's School	4,861,084	4,586,124	4,940,940	354,816
City of London School	3,229,652	3,155,942	3,333,962	178,020
City of London School For Girls	2,250,368	1,742,499	2,009,500	267,001
GSMD	2,265,131	1,992,445	1,945,596	- 46,848
GSMD - Milton Court	3,876,940	3,824,892	3,947,152	122,260
GSMD - Sundial Court	1,776,176	1,648,327	1,450,305	- 198,022
Guildhall Complex	17,810,289	14,319,976	13,041,092	- 1,278,884
London Central Market (Smithfield)	17,049,847	10,491,520	11,433,828	942,307
London Metropolitan Archives	1,344,258	1,265,552	1,162,774	- 102,779
London Wall Car Park	219,171	215,333	205,523	- 9,810
Mansion House	2,289,797	2,250,048	1,725,984	- 524,064
Mayor's Court	313,093	253,760	262,489	8,729
New Spitalfields Market (Landlords)	6,800,091	5,826,230	5,858,179	31,949
New Street (21)	1,807,820	2,545,050	2,640,699	95,650
Open Spaces East Heath & Kenwood	215,554	193,818	141,111	- 52,707
Open Spaces Epping Forest	662,688	776,898	638,237	- 138,661
Open Spaces Golders Hill & Extension	361,751	454,447	239,749	- 214,698
Open Spaces Hampstead Heath Leisur	e 656,692	671,636	649,132	- 22,504
Open Spaces Parliament Hill	268,167	279,111	292,830	13,718
Streetlighting	3,622,410	1,983,340	1,879,814	- 103,527
Tower Bridge	2,305,342	2,015,186	2,325,066	309,880
Tower Hill Coach & Car Park	542,795	537,209	549,299	12,091
Walbrook Wharf Cleansing Depot	1,727,333	2,124,381	2,172,032	47,651
Grand Total	112,241,179	94,205,724	94,960,026	754,302

# 2. Bottom 5 performing sites

Bottom 5 Performing Sites Weather Corrected	Mar-22	Mar-23	Difference kWh 23 vs 22	Potential Rationale
Barbican Arts Centre	15,004,662	16,609,177	1,604,515	The data is based on estimated indicates a high proportion of estimated data, and the Energy Team have utilised our own estimates for several meters believed to be impacted by the PSDS project. It must be noted that there is still a reduction in consumption against the baseline year.
London Central Market (Smithfield)	10,491,520	11,433,828	942,307	There has been a 22% Increase in occupancy compared to 21/22; however there has been a 33% reduction in consumption since the Baseline year. East and West BEMS maintenance/upgrade issues likely means a temporary period of higher energy consumption
Bishopsgate Police Station	2,769,529	3,453,913	684,384	The BMS was broken, boilers were turned on 24/7, canteen/kitchen running longer hours. Still a reduction against baseline year
City of London Freemen's School	4,586,124	4,940,940	354,816	Philip House was unoccupied during baseline year. Emphasis on improved ventilation as a result of covid. The Energy Team have collaborated with the site to develop a list of Energy Conservation Measures (ECMs) which include review of ventilation, heating and cooling system. The Energy team will continue to support the site
Tower Bridge	2,015,186	2,325,066	309,880	BEMS upgrade challenges could indicate boilers running out of hand. The Energy Team will support the site to address these and upcoming challenges.

# $3.CO_{2e}$ targets for City of London Corporation

City of London (own operations)	Units	Scope	2018	2019	2020	2021	2022	2023	2024	2025	2026	2030	2035	2040
Corporate Properties and Landlord Area	ktCO ₂ e	Scope 1 & 2	36.4	33.9	30.4	24.4	22.8	19.4	18.1	17.0	14.85	7.2	4.5	3.1
Carbon Removals and Land														
Management														
(Scope 1)	ktCO ₂ e	Scope 1	-16.2	-16.2	-16.2	-16.2	-16.2	-16.2	-16.2	-16.2	-17.64	-17.6	-17.6	-17.6
Total net zero emissions	ktCO ₂ e	Scope 1 & 2	20.2	17.7	14.2	8.19	6.54	3.18	1.83	0.76	-2.79	-10.5	-13.1	-14.6
Net (negative removed)	ktCO ₂ e	Scope 1 & 2	16.2	16.2	16.2	16.2	16.2	16.2	16.2	16.2	17.6			
% reduction against baseline year	%	Scope 1 & 2	0%	-7%	-16%	-33%	-37%	-47%	-50%	-53%	-59%			
Target amount to reduce in period	ktCO ₂ e	Scope 1 & 2					13.6		4.7		3.2			
% of target to deliver in that period	%	Scope 1 & 2					63%		22%		15%			
Total target amount to reduce	ktCO ₂ e	Scope 1 & 2									21.5	To be redu	ced by 202	26/7

#### 4. PSDS Project update

The PSDS projects are now pending practical completion.

# 5. List of key sites in an energy performance partnership with Vital Energi

Guildhall Complex	City of London School	London Metropolitan Archives
Barbican Arts Centre	City of London School for Girls	Tower Hill Car Park
London Central Market (Smithfield)	Walbrook Wharf Cleansing Depot	GSMD – Sundial Ct
Central Criminal Court	Tower Bridge	
New Spitalfields Market	GSMD - Milton Court	
City of London Freemen's School	Mansion House	
Billingsgate Market	GSMD	

High Level Assessments of all the above sites have been completed, with further surveying in progress for the remainder. Projects are now being selected for investment grade proposals with initial work on this well underway. These projects will be presented for gateway approval and are not affected by the review of the capital programme. Projects under consideration will include (but not be limited to):

- Energy efficient lighting and controls
- Improvements to HVAC systems
- Optimisation and improvement of BMS controls
- Hydraulic and pumping optimisation
- Low carbon heating
- Renewables
- Fabric measures and draught proofing.

#### 6. Tenant consumption

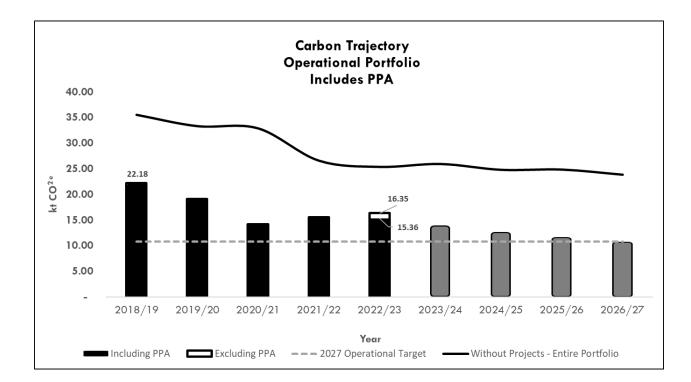
Note: This table has been newly created due to feedback from stakeholders requesting information about tenant and landlord consumption.

Tenant Consumpt								
ion figures (kWh)	Location	Total 21/22	April - June 2022 Q1	July - Sept 2022 Q2	Oct - Dec 2022 Q3	Jan - March 2023 Q4	Total 22/23	% Increase 21/22
Electricity	Billingsgate Market	1,477,333	362,744	374,611	337,813	225,565	1,300,733	12% 🔻
Gas	Billingsgate Market	741,776	129,255	33,201	246,683	286,759	695,898	6% 🔻
Electricity	London Central Market (Smithfield)	5,599,694	1,732,696	1,874,316	1,774,216	1,431,586	6,812,814	22% 🔺
Electricity	New Spitalfields Market (Landlords)	4,979,897	1,234,481	1,661,938	1,190,681	1,037,656	5,124,756	3% 🔺
Electricity	Walbrook Wharf	101,534	23,912	23,869	25,428	25,459	98,668	3% 🔻

#### 7. Operational properties only

The black bars represent operational portfolio carbon.

- The grey bars represent projected carbon.
- The white bar with the black lining shows what carbon *would* have been without the PPA at 16.35 kt CO2e.
- The black bar indicates carbon including the PPA at 15.36 kt CO2e.
- The black line shows actual carbon and projected carbon for the City's entire portfolio, including operational, investment and housing. Current quarterly carbon emissions are available in the CAS dashboard.



Committee(s)	Dated:
Operational Property and Projects Sub Committee – For	03 July 2023
information	
Subject: City Surveyor's Business Plan 2022-27	Report – public
Quarter 4 2022/23 Update	
Which outcomes in the City Corporation's Corporate	4, 7, 11, 12
Plan does this proposal aim to impact directly?	
Does this proposal require extra revenue and/or	Ν
capital spending? N/A	
If so, how much? N/A	N/A
What is the source of Funding? N/A	N/A
Has this Funding Source been agreed with the	N/A
Chamberlain's Department? N/A	
Report of: The City Surveyor (CS 184/23)	For Information
Report author:	
John Galvin / Faith Bowman	
City Surveyor's Department	

#### Summary

This report provides Members of Operational Property and Projects Sub Committee (OPPSC) details of progress in quarter 4 (January to March) 2022/23 against the 2022-27 Business Plan. A similar report is presented to Members of Investment Committee (IC, CS 176/23).

The department has continued to perform well in a challenging environment. The delivery of core services remains the focus of the team, and normalising performance following the considerable turbulence arising from the COVID-19 pandemic.

At the end of the reporting year, of the eight departmental key performance indicators (KPIs) relevant to this Committee, four achieved (green), and four failed (red) to meet their targets.

The red indicators were as follows:

- KPI. 1 Asset realisation and additional income
- KPI. 2 Space utilisation
- KPI. 3 Delivery of Climate Action Strategy Milestones Operational estate
- KPI. 7 Capital Projects project risk status

The City Surveyor's end of year outturn reveals that the department was overspent by £569,000 at year end on City Fund and City Cash services. This was against a budget of £28.9m (2%).

# Recommendation(s)

That Members note the content of this report.

# Main Report

# Background

1. In line with the City Corporation's performance management approach this is a quarterly report on the progress made during quarter 4 of 2022-23 (January to March) against the 2022-27 Business Plan.

# **Current Position**

- 2. This report provides the latest budget information which is set out in Appendix A. Appendix B provides a detailed table of the department's Key Performance Indicators (KPIs). This indicates to which Committee (OPPSC or IC) a measure is being reported. Charts of performance indicators are included in Appendix C.
- 3. A separate monitoring report on the risks within the department is also circulated for this meeting.

# **Financial Statement**

- 4. The City Surveyor's end of year outturn reveals that the department was overspent by £569,000 at year end on City Fund and City Cash services. This was against a budget of £28.9m (2%). Bridge House Estate services were £777,000 underspent, largely due to savings on business rates, lower than anticipated voids, and from some business rate refunds in earlier years. If this is considered, the overall position is an underspend of £208,000 against a total budget of £31.2m (0.7%).
- 5. The full details of the variances are set out in Appendix A. The overspend on the City Surveyor's City Fund and City Cash services is principally due to residual Target Operating Model (TOM) and Fundamental Review (FR) savings targets not being achieved in the year. This included £280,00 of cross cutting FR savings relating to the centralisation of project and asset management across the City, which predate the TOM and cannot now be achieved. Going forward it has been agreed that these FR savings will be met from the overall savings on the new Integrated Facilities Management contract which came into effect in April 2023.

# Quarter 4 2022/23 update

6. A RAG status is used to summarise the progress of the performance indicators we are measuring on a quarterly basis. The table below provides an 'at a glance' status report for the City Surveyor's KPIs for both its reporting Committees at the end of quarter 4.

Status ¹	Green	Amber	Red	TBC	N/A
Operational Property and Projects Sub Committee	4		4		
Investment Committee	4		3	1	1
Overall ²	5		6	1	1

- 7. For the department, five measures achieved their target (green) whilst six failed to do so (red). One measure (KPI. 12 minimise voids) is reported every six months in quarters 1 and 3, and one further measure (KPI. 13 outperform MSCI benchmark) was still being finalised at the time of writing this report. This figure will be reported separately to the July IC.
- 8. The following four measures relevant to OPPSC were behind target.
  - A. KPI. 1 Asset realisation and additional income

The objective of this indicator is seeking to achieve in excess of 90% of the total forecast of asset realisation and additional income. The forecast figure was  $\pounds$ 19.6m for 2022/23.

The end of year performance did not achieve target. This was principally due to West Ham Park (target of  $\pounds$ 13.1m) where the sale has yet to conclude.

The department concluded  $\pounds 3.057m$  in highways disposals and generated  $\pounds 0.591m$  of additional income. This income is generated on behalf of the organisation.

B. KPI. 2 – Space utilisation

The objective of this KPI is to reduce the office space cost per FTE at the non-events space at the Guildhall by 5%. The target figure was  $\pounds$ 4,728 per FTE.

The end of year figure for non-events space was £5,666 per FTE. This was £938 above the target figure.

The function was heavily impacted by inflation, which raised occupancy costs above expectation. Further, funding was not provided to enable

¹ Red = High Risk of Failure or Not Achieved; Amber = Some Concern; Green = On Target or Achieved.

² Some KPIs relate to both IC and OPPSC. Therefore, row indicating KPIs overall is not a total of the IC and OPPSC rows.

office changes and moves prior to a formal decision on the Guildhall Refurbishment project. This has placed a limit on the number of building occupiers. As many of the drivers of this indicator's performance are outside the department's control, a revised KPI is being developed for 2023/24.

C. <u>KPI. 3 – Delivery of Climate Action Strategy (CAS) milestones –</u> operational property

The objective of this KPI is a 5% year-on-year reduction in carbon emissions.

The quarter 4 result for 2022/2023 was a 1% increase in emissions when compared to the same period in 2021/2022 (corrected for the impact of weather).

It is highlighted that the 2021/22 figure was still impacted by lockdowns arising from the COVID-19 pandemic. This artificially pushed down energy consumption / carbon emissions. When compared to the 2018/19 baseline year, a weather corrected emissions have decreased by 15%. This is in line to meet the long-term CAS objectives.

D. KPI. 7 – Capital projects – project risk status

This indicator looks at the RAG status of each project with target that fewer than 20% of projects have an overall assessment of "red". At quarter 4 this was 43%.

A significant number of projects are outside of target, this principally due to increased cost resulting from high levels of construction price inflation (as highlighted in the department's risk register), and extended programmes resulting from COVID-19.

# Conclusion

9. Over 2022/23 the department continued to perform well. Whilst some measures did not achieve the target set the relevant teams are working diligently to recover time and ensure that programmes are delivered in line with expectations. Whilst the department's local risk position is challenging and inflation costs rising it continues to develop income and receipts for the organisation.

# Appendices

- Appendix A Budget Monitoring Statement
- Appendix B Key Performance Indicator Table
- Appendix C Headline Performance Charts

# **Background Papers**

- The City Surveyor The City Surveyor's Business Plan 2022-27 (CS 454/21)
- The City Surveyor The City Surveyor's Business Plan 2022-27 Quarter 1 2022/23 Update (CS 271/22)
- The City Surveyor The City Surveyor's Business Plan 2022-27 Quarter 2 2022/23 Update (CS 361/22)
- The City Surveyor The City Surveyor's Business Plan 2022-27 Quarter 3 2022/23 Update (CS 065/22)

#### Faith Bowman John Galvin Departmental Performance & Services City Surveyor's Department

E: john.galvin@cityoflondon.gov.uk

This page is intentionally left blank

# **Budget Monitoring Statement**

LOCAL RISK BUDGET Year to 31st March 2023	Final Approved Budget £000	2022/23 Actual Spend £000	Under / (Over) Spend £000	Note
City Fund				1
City Fund Estate & Leadenhall	(2,080)	(1,886)	194	1
Walbrook Wharf	(1,072)	(1,026)	46	1
Mayor's & City of London Court	(20)	(16)	4	
Central Criminal Court	(382)	(499)	(117)	2
Lower Thames St Roman Bath	(7)	(8)	(1)	
R&M & MI Work for other departments	(1,283)	(1,429)	(146)	3
Corporate FM cleaning & security	(97)	(111)	(14)	
	(4,941)	(4,975)	(34)	
City's Cash				
City's Estate	(2,582)	(2,340)	242	4
Departmental	(9,421)	(10,298)	(877)	5
Mayoralty & Shrievalty	(93)	(36)	57	
R&M & MI Work for other departments	(1,883)	(2,041)	(158)	6
Corporate FM cleaning & security	(626)	(687)	(61)	
	(14,605)	(15,402)	(797)	
Guildhall Administration				
Guildhall Complex	(9,329)	(9,067)	262	7
	(9,329)	(9,067)	262	
Total City Surveyor Local Risk excl BHE	(28,875)	(29,444)	(569)	
Bridge House Estates				
Bridge House Estates	(2,085)	(1,284)	801	8
Tower Bridge Corporate FM cleaning	(262)	(286)	(24)	
	(2,347)	(1,570)	777	
Total City Surveyor Local Risk incl BHE	(31,222)	(31,014)	208	

- 1. Savings principally on cyclical works, facilities management salaries, and professional fees. This was, in part, offset by a resulting reduction in service charges.
- 2. Overspend due to higher salary costs arising from agency cleaning staff and security overtime needed for events. Further significant energy price increases impacted this budget line.
- 3. There was an increase in one off reactive work across the portfolio as footfall rose as COVID-19 restrictions were lifted.
- 4. Savings principally due to reduction in the landlord's cyclical works programme to reflect planned disposals.
- 5. The overspend is mainly due to the residual Target Operating Model (TOM) and Fundamental Review (FR) savings target not being achieved or delayed. This includes £280k of cross cutting FR savings relating to centralisation of project and asset management which could not be achieved. They are planned to be

met from 2023/24 from savings achieved on the new Integrated Facilities Management contract.

- 6. There was an increase in one off reactive works across the portfolio due to higher footfall as COVID-19 restrictions were lifted, particularly on open spaces.
- 7. The underspend was primarily due to savings on water costs due to a rebate received, a reduced requirement in relation to clothing and uniform, on fees and services, and an energy rebate due to the Power Purchase Agreement.
- 8. The underspend was principally due to a saving on business rates. There were some significant business rate refunds achieved in respect of previous financial years, together with lower voids than anticipated, meaning the tenants picked up the anticipated rating costs rather than the City Corporation.

# **KPI Performance Table** Quarter 4 2022/23

Key Perfd	Key Performance Indicators											
Ref	Title				٥1 ز	1	07	2	ÊD	8	, b0	
		Target	Group	Committee	Actual	RAG	Actual	RAG	Actual	RAG	Actual	RAG
KPI. 1	Asset Realisation and additional income	£19.6m	CPG	OPPSC	on target	green	on target	green	off target	amber	£6.0m	red
KPI. 2	Space Utilisation*	£4,728	CPG	OPPSC	n/a	n/a	£5,867	amber	n/a	n/a	£5,666	red
KPI. 3	Delivery of Climate Action Strategy Milestones - operational estate	<5%	90	OPPSC	>5%	amber	>5%	amber	>3%	amber	>1%	red
KPI.4	Delivery of Climate Action Strategy Milestones - investment property	on schedule	90	IC	on target	green	2 mth delay	amber	2 mth delay	amber	Delayed	red
KPI. 5	Property contract Performance Compliance	> 90%	90	OPPSC	98.5%	green	99.2%	green	95.6%	green	97.2%	green
KPI. 6	Adherence to Budgetary Spend Profiles	95% - 105%	All	I C; OPPSC	17.0%	green	36.2%	green	59.1%	amber	96.4%	green
KPI. 7	Capital Project - Project Risk Status	< 20%	Ddd	I C; OPPSC	20.0%	green	27.0%	green	43.0%	amber	43.0%	red
KPI. 8	Capital Project- Health & Safety*	80%	Ddd	I C; OPPSC	n/a	n/a	81.0%	green	n/a	n/a	88.0%	green
KPI. 9	Capital Project - Site sustainability waste management	> 90%	Ddd	I C; OPPSC	97.0%	green	94.0%	green	%0.66	green	98.0%	green
KPI. 10	Rental Forecasts	£94.19m	Ddi	IC	£94.39m	green	£96.29m	green	£95.99m	green	tbc	green
KPI. 11	Minimise Arrears (reducing target <9% June,<7%Sept,<5%Dec <2%March)	<2%	DG	IC	9.3%	green	5.2%	green	5.0%	green	5.7%	red
KPI. 12	Minimise voids (*)	<5%	Ddi	IC	3.8%	green	n/a	n/a	2.0%	green	n/a	n/a
KPI. 13	Outperform MSCI**	exceed ben	Ddi	IC	n/a	n/a	n/a	n/a	n/a	n/a	tbc	tbc
	*reported bi annually											
	** reported annually											
	Investment Committee (IC) and Operational Property and Projects Sub Committee (OPPSC)	)PPSC)										

Page 533

This page is intentionally left blank

# **Headline Performance Charts**

Quarter 4 2022/23

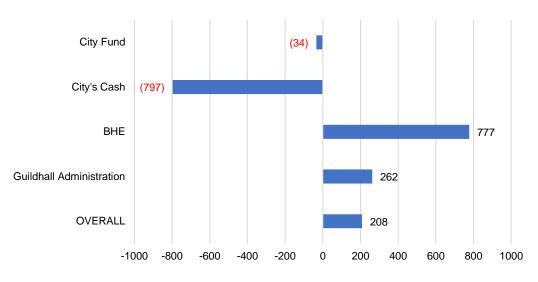
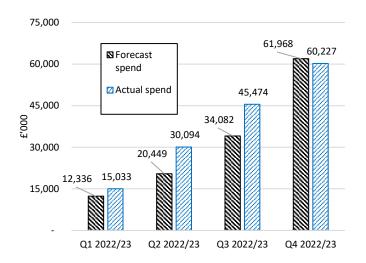
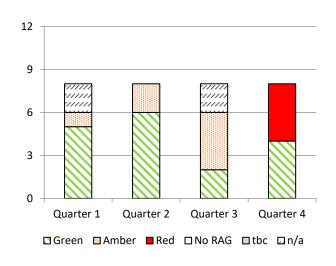


Figure 1 Year end variance against profiled local risk budget – (overspend) or underspend (£'000)







**Figure 4** Performance of KPIs linked to Corporate Property (Operational Property and Projects Sub Committee)

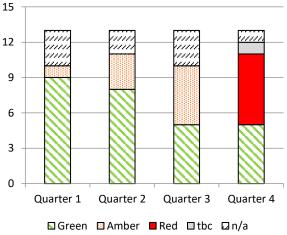


Figure 3 Performance of departmental KPIs overall

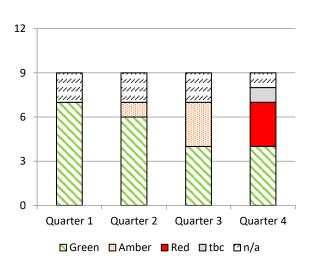


Figure 5 Performance of KPIs linked to Investment Property (Property Investment Board)

This page is intentionally left blank

Committee(s)	Dated:
Operational Property and Projects Sub Committee – For information	03 July 2023
<b>Subject:</b> The City Surveyor's Corporate and Departmental Risk Register – June 2023 Update	Public
Which outcomes in the City Corporation's Corporate Plan does this proposal aim to impact directly?	4, 7, 11, 12
Does this proposal require extra revenue and/or capital spending? N/A	Ν
If so, how much? N/A	N/A
What is the source of Funding? N/A	N/A
Has this Funding Source been agreed with the Chamberlain's Department? N/A	N/A
Report of: The City Surveyor (CS 183/23)	For Information
Report author: John Galvin / Faith Bowman City Surveyor's Department	

#### Summary

This report has been produced to provide Members of Operational Property and Projects Sub Committee (OPPSC) with a quarterly update on the management of risks within the City Surveyor's Department.

The City Surveyor's Risk Register is reported to two Committees – OPPSC (CS 183/23) and Investment Committee (IC) (CS 181/23). The way that the risks map to the two Committees are included as Appendix A. Only risks relevant to this Committee are included within the detailed risk register (Appendix B). The full departmental risk register is available on request.

The City Surveyor is the owner for one corporate risk. There are a further eight risks on its Departmental Risk Register relevant to this Committee. Three of these departmental risks are recorded as red. The red risks currently being managed are:

- Corporate Risk:
  - CR 37 Maintenance and renewal of Corporate Operational Assets (excluding housing assets) – OPPSC Current risk score 16 (Red)
- Departmental Risks:
  - SUR SMT 005 Construction Price Inflation IC & OPPSC Current risk score 16 (Red)
  - SUR SMT 006– Construction Consultancy Management IC & OPPSC Current risk score 16 (Red)
  - SUR SMT 009 Recruitment and retention of property professionals IC &OPPSC

Current risk score 16 (Red)

# Recommendation(s)

Members are asked to note this report, and the actions taken within the City Surveyor's Department to effectively monitor and manage risks arising from our operations.

# **Main Report**

# Background

- 1. The City of London Corporation's Risk Management Policy and Strategy (RMP&S) requires each Chief Officer to report regularly to Committee the key risks faced in their department. Both OPPSC and IC have determined that they will receive the City Surveyor's risk register on a quarterly basis.
- 2. Aligned with the new reporting arrangements we are now only reporting through to your Committee the risks which are relevant under the Committee's terms of reference. For clarity and transparency Appendix A provides a summary table of all departmental risks and the Committee to which they are reported. The full departmental risk register is available to Members upon request.
- 3. The risks relevant to this Committee are included as Appendix B to this report.
- 4. Risks are reviewed regularly by the department's Senior Management Team (SMT) in line with the organisation's RMP&S. Risks are assessed on a likelihood-impact basis, and the resultant score is associated with a traffic light colour.
- 5. Should any changes occur between formal meetings a process exists such that risks can be captured, assessed, and mitigating activities captured. This ensures that the risk management process remains 'live'.

# **Current Position**

- 6. The key points to note for this period are captured below:
  - A. CR 37 Maintenance and Renewal of Corporate Operational Assets Current risk score 16 (Red)

The City Surveyor's Department has one red Corporate Risk. This risk articulates the gap between the funding available for our Corporate operational assets (excluding housing) and that required by the asset. This risk has been slightly re-written since the last report to this Committee (CS 059/23) to focus on the Corporate estate, and to highlight issues experienced at certain sites – notably the Barbican Centre and the Guildhall School of Music and Drama.

The principal mitigation for this risk lies in the allocation of sufficient funds to bring these assets up to the standard required by asset users.

The City Surveyor is working with colleagues from across the City Corporation to progress further mitigations as outlined in Appendix B.

B. SUR SMT 005 – Construction Price Inflation Current risk score 16 (Red)

Over the past 12-24 months, the construction industry has seen significant input price inflation. Whilst the peaks of this uplift have started to fall back, inflation is still high in the sector. Further, whilst some products have seen prices reduce, others (notably labour) are expected to remain at an elevated level. Within the City of London context, existing contracts will continue to suffer from costs in excess of those initially anticipated at project commencement.

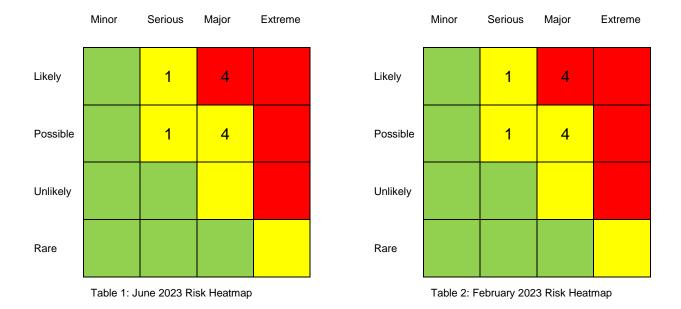
C. SUR SMT 010 – Insurance – Investment & Corporate Estate Current risk score 12 (Amber)

The City Corporation needs to ensure that it keeps an up-to-date register of property valuations to ensure that it meets provisions under its insurance policies. This activity has now been funded and is underway. As this progresses it is expected that the scoring associated with this risk will reduce.

7. Since the last review in February, there were no new departmental level risks identified. This will be kept under review.

# Heatmap

- 8. Through the performance dashboard tool, Power BI, it is possible to create heatmaps of the department's risks as below. This is a graphical summary of the current departmental risks (left). A comparison with the those presented at the last report (February) is included as the table on the right. Note that the table includes the Corporate Risk and all departmental risks that are being managed by the department.
- 9. The Heatmaps do not track individual risks over time, rather it is a snapshot comparison of the overall risk profile. Whilst the overall profile of the risks did not change between the two periods, a number of mitigations have been progressed. In many instances it was considered prudent to retain the risks at their current level considering wider economic uncertainty.



# Conclusion

10. Members are asked to note the recent changes to the departmental risk register, and the actions taken by CSD to mitigate the likelihood and/or impact of the risks.

# Appendices

- Appendix A Risks by Committee
- Appendix B
   The City Surveyor's Corporate and Departmental Risk
   Register relevant to this Committee

# **Background Papers**

 The City Surveyor
 The City Surveyor's Departmental Risk Register – September 2022 Update (CS 270/22)
 The City Surveyor
 The City Surveyor's Departmental Risk Register – November 2022 Update (CS 357/22)
 The City Surveyor's Departmental Risk Register – February 2023 Update (CS 059/23)

John Galvin Faith Bowman Departmental Performance & Services City Surveyor's Department

E: john.galvin@cityoflondon.gov.uk

#### Risks by Committee

- 1. The City Surveyor's Department (CSD) is currently managing one risk at the Corporate level (CR 37) and a further nine at the departmental level.
- 2. Outlined in the table below is how these risks relate to the two reporting Committees, Operational Property and Projects Sub Committee (OPPSC) and Investment Committee (IC).
- 3. Of the ten total risks, nine relate to OPPSC and six to Investment Committee.
- 4. Only risk relevant to the specific Committee will be presented to that Committee. The full list of risks and their mitigations are available upon request.

Code		Title	OPPSC	IC	Score
CR 37		Maintenance and renewal of Corporate Operational Assets (excluding housing assets)	X		16
SUR 005	SMT	Construction Price Inflation	X	X	16
SUR 006	SMT	Construction Consultancy Management	X	X	16
SUR 009	SMT	Recruitment and retention of property professionals	X	X	16
SUR 002	SMT	Insufficient budget to meet user and asset demand at Guildhall	X		12
SUR 003	SMT	Investment Strategy Risk		X	12
SUR 010	SMT	Insurance - Investment and Corporate Estates	X	X	12
SUR 011	SMT	Contractor Failure	X	X	12
SUR 007	SMT	Energy Pricing	X		8
SUR 008	SMT	Special Structures	Х		6

This page is intentionally left blank

# SUR Departmental risks - detailed report EXCLUDING COMPLETED ACTIONS for COMMITTEE

**Report Author:** Faith Bowman **Generated on:** 02 June 2023



Rows are sorted by Risk Score

Risk no, title, creation date, owner	Risk Description (Cause, Event, Impact)	Current Risk Rating &	& Score	Risk Update and date of update	Target Risk Rating & Score	Target Date/Risk Approach	Current Risk score change indicator
Corporate Operational Assets (excluding	Cause: Poor property condition combined with insufficient budget allocation to maintain assets in line with strategy/ commitments/expectations. Event: Misalignment between funding available and that required by the asset (as defined by the relevant Asset Management Strategy). Impact: Built estate becomes not fit for purpose / functions / occupancy. Cost of maintenance and utility costs increases, placing further pressure on City resources. In extreme circumstances there will be H&S implications, leading to potential enforcement action, legal action by tenants or asset failure in whole or part with detrimental effects leading to impact on occupiers	Impact	16	The main driver of this risk is the adequacy of funding to manage and mitigate asset risks. This risk is corporate wide, so extending to sites where asset accountability sits with the relevant Premises Controller in occupation. This risk includes the Barbican and the Guildhall School of Music and Drama (GSMD). At these sites there is a requirement to ensure an appropriate experience for audiences, performers, students and staff, to sustain their business models. Whilst funding remains the overriding mitigation, the City Surveyor is	Impact 8	31-Mar- 2024	

04-Nov-2019 Paul Wilkinson	<ul> <li>working to ensure that accountability and responsibilities for maintenance is understood across the organisation.</li> <li>Where gaps in expertise or capacity exist, the City Surveyor is looking to develop solutions with the Premises Controllers in line with his role as the Head of Profession.</li> <li>02 Jun 2023</li> </ul>		Reduce	Constant

Action no	Action description	Latest Note	Action owner	Latest Note Date	Due Date
CR37a	Cyclical Works Programme (CWP)	<ul> <li>The Cyclical Works Programme (CWP) is the principal way that the backlog of asset maintenance is delivered to Corporate properties (excluding ring-fenced assets).</li> <li>A paper was presented to Operational Property and Projects Sub Committee (OPPS) in April 2023 which includes a proposal to address the cyclical maintenance backlog to achieve the Corporate Property Asset Management Strategy 2020/2025 and beyond. This recommended funding a ringfenced programme of works to address the backlog element of the portfolio. This paper included a detailed appendix which included a 10-year forward look at our asset requirements.</li> <li>OPPSC supported the approach presented by the City Surveyor. This approach is subject to funding, and this will be discussed at Resource Allocation Sub Committee (RASC) in June.</li> </ul>		02-Jun- 2023	31-Mar- 2024
CR37b	Ring fenced properties and budgets (CoLP estate, New Spitalfields, Billingsgate and the three private schools	The City Surveyor's Department (CSD) is communicating with ring fenced departments to identify appropriate building maintenance requirements and spend (forward maintenance). These departmental occupiers allocate their own funds for the maintenance of the built assets. Whilst CSD recommends work to be undertaken, it is the occupying department who holds the budget responsibility and thus decides with final control over maintenance activity. This element is being mitigated through the delivery of the recommendations arising from the recent Internal Audit. Whilst there has been progress in some areas, the actions have not been implemented comprehensively across the Corporation. A follow-up review of the Audit Recommendations has been scheduled for June/July 2023 and the department will be supporting this activity.	Paul Wilkinson; Peter Young		31-Mar- 2024

		CSD has recently reviewed all departmental risk registers in order to identify property & asset maintenance risks. This was in order to validate the articulation and approach taken by this corporate risk, and to identify any areas of concern.			
CR37f	Annual Major Capital Bids	The City Surveyor's Department is progressing several capital projects, and these are essential to keep the operational estate including the Guildhall in a good standard. Significant works have been identified from the recent Smithfield Market Condition Survey and if not funded present a live Health and Safety risk for Markets. Some departments submit their own direct bids based upon advice from the City Surveyor. If more H&S works are required, this limits the scope for further improvement projects.	Peter Young	02-Jun- 2023	31-Mar- 2024
		There will be no capital bids for 2023/24 – however there will be a small emergency funding pot should any immediate H&S issue arise.			
CR37g	Operational Property Review	The City Corporation has recently commenced an Operational Property Review (OPR) to consider the future property requirements to deliver the organisations services. This will align with the Resource Priority Refresh programme.	Peter Young	02-Jun- 2023	31-Mar- 2024
		The review is commencing and further details as to milestones and objectives will be available shortly.			
		Rationalisation of the organisation's property estate will help alleviate pressure on maintenance budgets. However, it should be highlighted that rationalisation will only be able to make a small contribution to the overall position. The OPR programme will be reported to RASC in June.			
CR37h	Renewal Programmes	The Barbican Centre renewal project is a £50-£150m project which will repair the building to it can function long into the future, opening up under-utilised space, improving accessibility, whilst delivering against its sustainability aspirations. Public survey and workshops were completed in December 2022 with detailed public consultation scheduled for Spring 2023.	Claire Spencer; Jonathan Vaughan;	02-Jun- 2023	31-Mar- 2024
		The Guildhall School of Music and Drama (GSMD) are working closely with corporate colleagues to develop and further the Barbican Renewal Team. Further, it is working with the Department of Community and Children's Service in respect of waterproofing works, and the City Surveyor on Fire Safety. GSMD have also engaged space consultants who are undertaking a wide-ranging review of the site. This is with the view that current and future needs are detailed, and future funding bids align with this requirement.	Peter Young		
		The Guildhall Renewal programme has recently been presented to Members. However, this programme is at an early stage, so will not offer immediate mitigations to this risk.			

(	CR37i	$\mathcal{E}$	The new Integrated Facilities Management (IFM) contract commenced in April 2023, and this		02-Jun-	31-Mar-
			has added resilience to maintenance and repair functions. This benefit is particularly apparent	Collinson	2023	2024
			at the Barbican Centre and the Guildhall School of Music and Drama			

Risk no, title, creation date, owner	Risk Description (Cause, Event, Impact)	Current Risk Rating	& Score	Risk Update and date of update	Target Risk Rating &	Score	Target Date/Risk Approach	Current Risk score change indicator
SUR SMT 005 Construction Price Inflation	<b>Cause</b> : Market conditions have led to input price inflation <b>Event:</b> Project and programme cost escalation <b>Impact</b> : Inability to delivery capital and revenue projects within budget	Impact		Material costs and labour availability are combining to raise costs. Construction inflation is forecast to level out over the coming months, although not reduce. Existing contracts will continue to suffer from costs in excess of those initially anticipated at project commencement. Market conditions remain dynamic and will be kept under review. At this time it is felt appropriate that the risk score remain at its current level.	Impact	6	31-Mar- 2024	
14-Oct-2021 Ola Obadara				02 Jun 2023			Reduce	Constant

Action no	Action description		Action owner	Latest Note Date	Due Date
SUR SMT 005a		The department is working with legal and procurement to identify different buying options, thereby managing the risk to the department / organisation. This exploration included a review of the prior Single Stage tender process (which had been preferred for medium range projects - £2m - £50m). Following the review Two Stage contracts will be used more frequently. This is the current market norm for these projects. The change enables contractors to better transfer their risk and leaves the City with a degree of cost uncertainty, even post Gateway 5. Whilst this transfer is not desired, it offers far better market coverage and reflects the prevailing external conditions. This will be kept under review.			31-Mar- 2024
SUR SMT 005d	Contracts	1 I B			31-Mar- 2024

	contractors to bid on projects, however the inflation risk has been transferred to the organisation. The value of this approach will be continually reviewed.		
SUR SMT 005e	We are looking to engage early with our contractors on a consultancy basis to obtain as much information as possible prior to contract.		 31-Mar- 2024
SUR SMT 005f	Ensuring materials are readily available before and during the design phase and, if possible, procure in advance of the contract. Further consideration is being given to the origin of source materials to ensure supply.		31-Mar- 2024

Risk no, title, creation date, owner	Risk Description (Cause, Event, Impact)	Current Risk Rating &	Score	Risk Update and date of update	Target Risk Rating &	Score	Target Date/Risk Approach	Current Risk score change indicator
SUR SMT 006 Construction Consultancy Management	Cause: Poor performance by consultants Event: Abortive work, delays, or non-performance. Impact: Additional costs, project delays	Impact	16	This relates to abortive design / development. The department continues to suffer the impacts of this risk, with action being taken against consultants when their performance does not meet expectations. Aligned with other departmental risks, the department is stretched for resource. This had led to fewer leads being responsible for a greater number of projects. This reduces scrutiny capacity and can increase the likelihood of errors. There is a link to our internal recruitment and retention risk (SUR SMT 009) as property professionals across the industry are moving companies at a greater rate. This means that the delivery lead often changes throughout the life of the project, and replacements are often not at the same quality as those engaged at earlier stages.	Impact	4	31-Mar- 2024	
14-Oct-2021 Ola Obadara				02 Jun 2023			Reduce	Constant

Action no	Action description	Latest Note		Latest Note Date	Due Date
SUR SMT 006a	Commissioning stage		Ola Obadara	02-Jun- 2023	31-Mar- 2024
SUR SMT 006b	Legal		Ola Obadara	02-Jun- 2023	31-Mar- 2024
SUR SMT 006c	Procurement	Working with Procurement to increasing due diligence, particularly in regard to the quality of O contractor appointed (rebalancing the quality/cost equation). This is with the view that we will O get better quality applications and this risk may reduce.		02-Jun- 2023	31-Mar- 2024
SUR SMT 006d	Scope of works	The team is reviewing and tightening up the scope of works specification. This will counter opportunistic interpretations of the scope of works that we were seeing from some consultants.		02-Jun- 2023	30-Sep- 2023

Risk no, title, creation date, owner	Risk Description (Cause, Event, Impact)	Current Risk Rating & Score	Risk Update and date of update	Target Risk Rating & Score	Target Date/Risk Approach	Current Risk score change indicator
SUR SMT 009 Recruitment and retention of property professional	Cause: Uncompetitive pay and benefits structures within some professional grades; poor quality work environments; lack of professional progression over recruitment freeze and restructuring period; increased employee focus on work-life balance <b>Event</b> : Increasingly difficult to recruit suitably skilled staff at the correct level for the grade being recruited for. Increasingly difficulty to keep staff who get better reward packages from other organisation (both commercial and public sector) <b>Impact</b> : Increased vacancies, objectives unachieved or delivered late (including project delivery and income generation), reduced customer satisfaction, less real estate activity, reduced employee wellbeing, demotivation of staff. Increased costs born by the organisation though recruitment campaigns and training etc, or to the department through filling vacancies through comparatively expensive temporary contracts.	Inpact 16	<ul> <li>This risk has been identified within a number of divisions within the City Surveyor's Department. The impacts vary by Group with the risk being particularly acute in Investment Property, Surveying and Project Management.</li> <li>This is aligned to pressures faced in other City departments, and CSD is engaging with corporate colleagues to ensure that the particular pressures felt within this department are understood broadly. This is reflected within the 8 themes identified and communicated by Corporate HR.</li> <li>The City's pay and reward review has recently commenced (January 2023) and the external consultancy Corn Ferry will be assisting in this analysis. The City Surveyor has scheduled meetings.</li> <li>The City's revised workplace posture (minimum 2 days in-the-office working) is being seen as a positive by staff and assists in the retention of staff who may otherwise leave for greater reward packages at competitor organisations.</li> <li>Whilst these activities are being pursued corporately, the department continues to ensure that it does everything it can do internally to mitigate this risk.</li> </ul>	8 Impact	31-Mar- 2023	

21-Jan-2022 02 Jun 2023	3 Reduce	Constant
-------------------------	----------	----------

Action no	Action description	Latest Note	Action owner	Latest Note Date	Due Date
SUR SMT 009a	Advertising	The department and the HR Business Partner has produced a recruitment best practice document, which includes ensuring that vacant posts are advertised in areas which will generate interest from suitably qualified candidates, including those currently under-represented within our workforce.	Paul Wilkinson	02-Jun- 2023	31-Mar- 2024
SUR SMT 009b	Best Practice	Including delivery of appraisals, regular one-to-ones, team and group meetings. This aims to improve communications at all levels, ensuring that CSD is a positive work environment and that issues/blockers can be raised and addressed. In some areas career graded roles have been instituted, and deployment can be further explored. CSD is supporting the work of Corporate HR in moving towards all on-line appraisal documentation. This will enable greater tracking of compliance.	Paul Wilkinson	02-Jun- 2023	31-Mar- 2024
SUR SMT 009c	Communication	Quarterly meetings from the department's Chief Officer so all staff feel engaged with the activities of the department.	Paul Wilkinson	02-Jun- 2023	31-Mar- 2024
SUR SMT 009d	Engagement with HR	Some of the items highlighted as the 'causes' of this risk are outside the control of CSD, and engagement with our Corporate partners will be critical to overcoming these items. This departmental risk directly supports the Corporate Risk on "Recruitment and Retention" (CR39).	Paul Wilkinson	02-Jun- 2023	31-Mar- 2024
SUR SMT 009e	Equalities, Diversity and Inclusion		Ola Obadara	02-Jun- 2023	31-Mar- 2024
SUR SMT 009f	Pay and Review Survey	The Corporation is reviewing pay & reward and the department is feeding into this activity. The department has highlighted that there are specific pressures within this department which may make the issue more acute within CSD roles.	Paul Wilkinson	02-Jun- 2023	31-Mar- 2024

Risk no, title, creation date, owner	Risk Description (Cause, Event, Impact)	Current Risk Rating	& Score	Risk Update and date of update	Target Risk Rating & Score	Target Date/Risk Approach	Current Risk score change indicator
SUR SMT 002 Insufficient budget to meet user and asset demand at Guildhall 10-Feb-2015 Peter Young	<b>Cause:</b> Insufficient funding available for Major Works, Cyclical Works and Reactive Maintenance to manage the repair demands on the Guildhall Complex. <b>Event:</b> Insufficient asset funding. <b>Impact:</b> The standard of the Guildhall Complex will deteriorate, resulting in; poorer working environments leading to increased dissatisfaction and lower employee productivity and potential increase in breakdowns and reactive costs as the basic infrastructure of the Complex becomes beyond economic repair.	Impact	12	The principal mitigation actions are related to forecasting and monitoring the allocation of financial and human resources. The wider consideration of the Guildhall complex was the subject of a report to Operational Property and Projects Sub Committee (OPPSC) in January 2023, where a sum was agreed to outline a viable scheme <b>02 Jun 2023</b>	4 Impact	31-Mar- 2024 Reduce	Constant

Action no	Action description	Latest Note	Action owner	Latest Note Date	Due Date
SUR SMT 002e	Guildhall		Paul Wilkinson; Peter Young		31-Mar- 2024
SUR SMT 002f	Team.	Single point of contact for Profit and Loss for event space created within the Remembrancer's. Shadow budget now agreed. The business plans of both the Remembrance and the City Surveyor have highlighted the delivery of this activity as a priority for 2023-24. A report will be presented to Finance Committee in July detailing the mechanics of the Trading Account.	Remembra ncer; Peter Collinson; John James; Peter Young		31-Oct- 2023
SUR SMT 002g	Maintenance Management		Peter Collinson	30-Jan- 2023	31-Mar- 2024

Risk no, title, creation date, owner	Risk Description (Cause, Event, Impact)	Current Risk Rating	& Score	Risk Update and date of update	Target Risk Rating &	Score	Target Date/Risk Approach	Current Risk score change indicator
SUR SMT 010 Insurance - Investment and Corporate Estates 26-May-2022	<ul> <li>Cause: Revaluation of the City Corporation's estates (Investment and Corporate) does not happen in a timescale compliant with insurance policy requirements or the terms of leases.</li> <li>Event: The City fails to meet the provision under its insurance policies that revaluations are undertaken by a RICS surveyor at least every five years (Investment and Corporate). The City is in breach of its legal obligations as a landlord under the terms of its leases to ensure that the full re-instatement value is insured .</li> <li>Impact: The insurance policy does not respond in full (Investment and Corporate). Potential legal action from commercial occupiers in the event of an incident for which there is not appropriate cover.</li> </ul>	Impact	12	This risk identifies the need of re- valuation of the City of London Estates – (Investment and Corporate) to ensure that the City reaches its legal obligations under its insurance policies. The last on-site valuations of the Investment Property Group estate and Corporate buildings (other than special sites) was undertaken in 2015. Funding has recently been identified and a budget is now in place. Instructions are being made to our contractors such that they can proceed with delivery. Once this is in train the risk score should start to reduce towards target. <b>02 Jun 2023</b>		1	31-Mar- 2024 Reduce	Constant

Action no	Action description	Latest Note	 Latest Note Date	Due Date
SUR SMT 010a	Register of data	A property schedule exists and this has been updated with the survey carried out on Special Sites (by RLF).		30-Sep- 2023
SUR SMT 010b	6	Where leases allow, the cost can be recovered from commercial tenants, and operational occupiers as appropriate. Funding has been agreed and a budget line identified (Jan 2023). As this is now in place instructions are due to be placed with contractors such that this activity can progress.	 	31-Mar- 2024
SUR SMT 010c	-	The delivery of this activity will be done by an external party, and the tender is scheduled to be published June/July period. The department is currently working with Procurement to ensure the optimal route to market.		31-Mar- 2024

Risk no, title, creation date, owner	Risk Description (Cause, Event, Impact)	Current Risk Rating & Score	Risk Update and date of update	Target Risk Rating & Score	Target Date/Risk Approach	Current Risk score change indicator
SUR SMT 011 Contractor Failure 13-Feb-2023	<b>Cause</b> : Market conditions <b>Event:</b> Failure of either a main contractor, or a substantial sub contractor <b>Impact</b> : Delayed delivery of projects, or the delivery of projects at a higher cost	Inpact	This risk relates to the failure of a main contractor, or a main sub contractor. Particularly with the second of these elements the City Corporation does not have significant influence over who is commissioned to undertake work. 02 Jun 2023	4 Impact	Avoid	Constant

Action no	Action description		Latest Note Date	Due Date
SUR SMT 011a		1 0		31-Mar- 2024
SUR SMT 011b		The department is instituting six-monthly reviews of contractor suitability. Historically this only happened at contract commencement. This will better prepare the organisation should the contractor (or significant sub-contractor) begin to experience difficulty.		31-Mar- 2024

Risk no, title, creation date, owner	Risk Description (Cause, Event, Impact)	Current Risk Rating	& Score	Risk Update and date of update	Target Risk Rating & S	Score	Target Date/Risk Approach	Current Risk score change indicator
Energy Pricing	Cause: Rapid increases in the market cost of energy Event: Increasing price born by the City of London Corporation Impact: Money directed to energy payments that could be used in other endeavours	Impact	8	The risk scoring associated with this risk has reduced due to two factors: The Power Purchase Agreement (solar farm in Dorset) provides circa 50% of the organisation's energy requirements at a significant discount to the market. Note that the impact will be seasonal. Broader energy market prices have fallen back since the heights seen in 2022. However, these prices remain higher than those seen prior to the invasion of the Ukraine. Due to on-going volatility this risk has been kept at the same risk score.	Impact	3	31-Mar- 2024	
18-Oct-2021 Peter Collinson				02 Jun 2023			Reduce	Constant

Action no	Action description			Latest Note Date	Due Date
SUR SMT 007a		Purchase Agreement (PPA), and energy efficiency measures.	Collinson; Graeme		31-Mar- 2024
SUR SMT 007b	Managing supplier failure	across both supply and generation. TGP has a low portion of income generated from UK domestic customers (thereby minimising price capping implications).			31-Mar- 2024

Risk no, title, creation date, owner	Risk Description (Cause, Event, Impact)	Current Risk Rating &	& Score	Risk Update and date of update	Target Risk Rating & Sc	core	Target Date/Risk Approach	Current Risk score change indicator
Special Structures	Cause: Lack of central register for special structures and/or ambiguity over accountability, responsibility for budget provision Event: Incomplete, or not up-to-date register of special structures and planned maintenance regime Impact: Potential failure of special structure and/or forced closure of asset / space	Impact	6	Special structures relate to those structural elements with an asset which supports other (often public) elements, so captures basements, sub- road spaces, supporting structures etc. There is no current central register of these structures within the portfolio, and therefore no current prescribed or routine inspection regime in place to ensure that these structures remain in a suitable condition.	Impact	2	31-Mar- 2024	
20-Oct-2021				02 Jun 2023			Reduce	Constant
Peter Young								

Action no	Action description		Action owner	Latest Note Date	Due Date
SUR SMT 008a	<ul> <li>a Special Structures register</li> <li>Funding to undertake the technical inspections, create the inventory and survey cu condition was approved as part of the Cyclical Works Programme (CWP) 22/23 B survey programme is now in progress.</li> <li>The initial desktop survey will develop a list of structures which require more detailed as the survey programme is now in progress.</li> </ul>			02-Jun- 2023	31-Mar- 2024
		The survey process is also developing survey programme for Special Structures (some assets will require more frequent assessment). This information will be captured on the Computer Aided Facilities Management (CAFM) software.			
SUR SMT 008b	Special structures – investment portfolio	accuracy of information.		02-Jun- 2023	31-Mar- 2024

SUR SMT 008d	departments to ensure that there is clarity over responsibilities and what actions need to	 	31-Mar- 2024
SUR SMT 008e	additional works to bridge the gap between current and desired condition, further funding bid	 	31-Mar- 2024

Committee(s)	Dated:		
Operational Property and Projects Sub Committee	July 3rd 2023		
Subject: CAS NZ1, NZ3 and RS3 Workstream update for the Operational Portfolio	Public		
Which outcomes in the City Corporation's Corporate Plan does this proposal aim to impact directly?	5,11 & 12		
Does this proposal require extra revenue and/or capital spending?	No		
If so, how much?			
What is the source of Funding?			
Has this Funding Source been agreed with the Chamberlain's Department?	Yes		
Report of: The City Surveyor	For Information		
Report author: Graeme Low			

#### Summary

This report presents an update on the key actions of the operational buildings workstreams as part of the Climate Action Strategy (CAS). Progress has been made in the following key areas:

- Investment Grade Proposals for 15 projects covering design and build proposals from Vital Energi. Citigen Decarbonisation transferred to the Square Mile Project Plan for CAS.
- The initial version of Design and Technology guidance has been completed, pilot use at key projects has begun.

#### Recommendation(s)

- Note progress made in delivery of project tasks including energy surveys, heat decarbonisation, and design and technology guidance.
- Note the progress on the delivery of capital projects including PSDS phase 1.

#### **Main Report**

#### Background

1. The Climate Action Strategy (CAS) measured our direct building emissions in 2018/19 as 36 ktCO₂e, by 2026/7 this must reduce to 15.3 ktCO₂e to reach our net zero target for our operational properties and Housing portfolio. CO₂e emissions are as follows:

#### Table 1: Baseline and current carbon emissions by portfolio and 2027 target.

Portfolio Baseline 2018/19		(2022/2023) - PPA included	2026/27 Target		
Housing	10.6 kt/CO ₂ e	5.82 kt/CO ₂ e	4.6 kt/CO ₂ e		
Operational	22.2 kt/CO ₂ e	15.36 kt/CO ₂ e	10.8 kt/CO ₂ e		

2. To support this goal, the CAS buildings approach was presented at the April Corporate Asset Sub Committee in 2021 with a series of discrete actions which conjoin to deliver the CAS strategy NZ1, NZ3 and RS3 for the Operational buildings' portfolio – including housing. These actions are summarised in the table 2 below and demonstrate the requirement for the City Corporation to continue investment in carbon reduction projects. Item 7 within the appendix provides an overview of the carbon reduction expected from planned interventions.

Table 2: NZ1 – Year 3 Operational property and housing landlord areas objectives

1.	Capital Programme Development - Operational Properties	7. CoLC plan for Citigen
2.	Delivery of Capital Programme – Operational Properties	8. Optimisation for sites connected to Citigen
3.	Capital Programme Development - Housing Properties	<ol> <li>Building controls management strategy and increased delivery capability</li> </ol>
4.	Delivery of Capital Programme - Housing Properties	<b>10</b> . Monitoring and targeting programme and increased delivery capability
5.	Decarbonisation plans for Operational properties	11. Staff Resources
6.	Decarbonisation plans for Housing properties	

# Status Updates:

# NZ1 Corporate Property and Housing Landlord Areas

**Objective 1,2&5:** Operational Properties: capital programme & decarbonisation plans

- 3. High Level Assessments have been undertaken of all the larger operational sites to identify viable carbon reduction measures. Based off these assessments a paper was approved by P&R and OPPS Committees in December 22 and January 23 respectively: Climate Action Strategy (CAS) Capital Delivery Programme for Operational Buildings. The total estimated programme cost is c.£5.3mil (excluding risk) to deliver savings of c.£550,000 and c.500 tCO2 per annum with an average payback c.10 years and cost per ton of carbon saved of c.£10,000/tCO2. This is Phase 1 of a proposed 3 phase programme of capital works which will be delivered up to 2027.
- 4. A delivery plan to support the multi-phase capital programme is currently being drafted. This will build on the gateway report to provide further detail how capital projects will be developed and prioritised across the operational portfolio. A Phase 2 programme will be informed by this and composed of projects currently under assessment.
- 5. Investment Grade Proposals are currently being developed for 15 projects in the programme. These are fixed price design and build proposals from Vital Energi our preferred main contractor. Gateway 5 papers are being prepared for each project and will be submitted for approval over June to August 2023. Delivery of the projects is projected over September 2023 to May 2024. Delivery will be supported through

commissioning of external programme and project management services and engineering expertise.

- 6. Decarbonisation studies are being finalised by external consultants for 10 operational sites. All associated site surveys have been completed and draft reports have been received for 7 sites, with all due for completion by end of August. The primary focus for these studies is to appraise the options for replacement of existing gas boiler systems with a low carbon heat supply to identify and provide costs and savings associated with the preferred solution. These solutions will then be appraised as part of the development of the capital programme (objective 1).
- 7. The delivery plan will be further supported by the development of c.33 in number sitespecific Decarbonisation Plans. These will set out how each site can contribute to the 2027 net zero target and how measures will be supported through CAS.

# Next Steps – Objective 1,2&5

- a. Completion of delivery plan.
- b. Complete decarbonisation studies for 10 operational sites.
- c. Commission external support services for delivery of capital programme.
- d. Completion of GW3-5 papers for capital works.
- e. Enter contract to commence capital works on the first projects
- f. Develop IGPs for a Phase 2 of the Operational properties' capital programme
- g. Draft and approval of gateway 2 paper
- h. Drafting site-specific Decarbonisation Plans for highest priority sites

# **Objective 3,4&6: Housing -** capital programme & decarbonisation plans

- 8. Survey work has been completed at the Barbican Estate to evaluate the benefit of improving insulation and heating controls with properties. Further cost analysis has recently been completed providing the value and benefit of undertaking these works. We continue to consult with Barbican residents as these proceed.
- 9. Housing surveys have been completed to assess options for improving the efficiency of landlord services have been completed. Final reports have been received and currently under review. These assess landlord operational emissions, focusing on options for PV, lighting upgrades, pump controls and ventilation improvements.
- 10. Decarbonisation studies on our 5 communally heated housing estates are in progress, with all sites surveyed and high-level assessments undertaken. Final reports have been completed for Barbican Frobisher and Isledon House with the remainder due for completion by August 2023.

# Next Steps – Objective 3,4&6

a. Completion of surveys and feasibility studies for pilot projects.

b. Complete the communally heating system studies.

**Objective 7&8 Progress:** Citigen: post-27 plan and site optimisation.

11. The approved Year 3 CAS plans transferred the Citigen decarbonisation to the Square Mile Plan to provide alignment with wider heat network workstreams. The scope of NZ1 focuses on the City Corporation's plans and options for the future supply of heat from Citigen to its own buildings and the optimisation of these buildings to support heat network efficiency.

- 12. City Surveyors have undertaken specific meetings with Citigen (and representatives from the parent company E.On) to set out our priorities for Citigen beyond 2027. Citigen are due to provide a heads of terms document to frame our discussions on the future relationship. We are preparing engagement with senior officers to establish our needs and concerns and appraise the options for our future commercial relationship with Citigen. We plan to prepare an update report for committee later this year.
- 13. Several of our sites supplied by Citigen are not meeting their obligations regarding return water temperatures back to the network. This is a major barrier to network decarbonisation, so we have commissioned a study to identifying the technical issues and providing a costed plan for improvements. The full scope of the study is due to be completed in June 2023, following which we shall develop a business case for improvements.

Nex	Next Steps – Objective 7&8					
a.	Engagement with internal senior stakeholders					
b.	Appraisal of future options, procuring specialist consultancy services to advise					
C.	Complete Citigen connected sites performance improvement study by June 2023 and engage Citigen on the findings and prepare business case					

Objective 9: Building controls management strategy and increased delivery capability.

- 14. The Schneider Electric Building Advisor platform (analytics) has been operating since July 4th for the Guildhall and LMA. A Gateway 3-5 paper was recently approved to extend the platform to Mansion House and Central Criminal Court in the coming months, as set out in the CAS Capital Programme.
- 15. The building controls strategy was drafted in November and is being reviewed prior to implementation.

#### Next Steps – Objective 9

a. Mobilisation of Building Analytics Software at Mansion House and CCC.

b. BEMS integration with Team Sigma.

**Objective 10:** Monitoring and targeting programme and increased delivery capability.

16. Benchmarking, target setting and analysis against variables is currently being set up within Team Sigma for individual sites. In Q2 we plan to have individual targets updated within Sigma, league tables set up for building categories and benchmarks in place to compare our building performance against National datasets.

Next Steps – Objective 10				
a.	Agree targets and set up exception reporting for sites by Q2			
b	Set up management reporting dashboards for key stakeholders to measure and track progress at building level. Q2			
C.	Implement process for rectifying issues found via FM. Q2			

# Objective 11: Staff resource

17. We have added support in place with Etude Consulting Ltd. Overseeing tasks relating to Housing. Additional levels of support are in place for 2023/24 for heat decarbonisation design standards and resilient buildings.

#### Next Steps – Objective 11

a. Appointment of remaining Energy Engineering Project Manager.

b. Actions 1,2,3,4 & 5 are reliant on a fully resourced Centre of Excellence.

#### NZ3 Capital Projects Design Standards and RS3 Resilient Buildings

- 18. The focus following publication at the end of My 2023 is on embedding both the Design and Technology standards. Engagement with a number of different Project Leads to pilot elements of the Standards in 2023, these include Barbican Renewal Programme, 23 Finsbury Circus and the Markets Relocation project. Pilots are due to continue for the remainder of Year 3. Learnings will feed into the review and update of the Standards.
- 19. Discussions in Q1 and continue into Q2 with key Energy Team members to source a historic asset to implement interventions. This pathway project will be key to gaining insight into suitable intervention measures for historic assets in support of improving sustainability across the portfolio.
- 20. Review and consolidation of the priority asset list and intervention measures has been completed in Q1. The scope for the Resilient Buildings Action Plan is being developed, the Plan is to be produced by a supplier and due by the end of Q2. Training on the Asset Resilience Portal will be rolled out in Q2.

#### Project support activities

21. Arcadis have been appointed by the City Surveyor to provide, initial assurance support; ongoing assurance; establishing and promoting the Centre of Excellence and to lead the development of an auditable energy management system. The assurance support is extended for the year 2023/24.

#### <u>Key risks</u>

22. Key risks are included within item 4. of the appendix.

#### **Corporate & Strategic Implications**

#### Strategic implications:

23. This suite of actions drives the objectives of the Climate Action Strategy, buildings stream and will provide linkage and co-ordination with ongoing property management, capital schemes and cyclical works.

#### **Financial implications:**

24. The CAS tasks in this report are covered within the overall Climate Action Strategy programme. Capital and resource costs are estimated at £21m for the 6-year term for the tasks related to these project plans. This funding forms part of the £68m agreed at RASC and P&R committees in September 2020.

#### **Climate implications:**

25. This action stream will deliver the Net zero carbon goals of the Corporation and support the climate residence goals of the broader programme.

#### Conclusion

26. Capital interventions are the primary focus for operational properties in 23/24 and work has begun to deliver these from Q1. Further phases of capital projects will be developed as part of a three-phase approach up to 2027. Design and Technology guidance is now developed to support the implementation of projects and will be introduced in the coming months.

#### **Report author**

#### Graeme Low

Head of Energy and Sustainability City Surveyor's Department E: graeme.low@cityoflondon.gov.uk

# Appendix

# 1. List of key sites in an energy performance contract with Vital Energi

1.Guildhall Complex	8. City of London School	14. London Metropolitan Archives
2. Barbican Arts Centre	9. City of London School for Girls	15. Tower Hill Car Park
3. London Central Market	10. Walbrook Wharf	
(Smithfield)	Cleansing Depot	
4. Central Criminal Court	11. Tower Bridge	
5. New Spitalfields Market	12. Mansion House	
6.City of London Freemen's	13. GSMD (inc. Milton	
School	Court and Sundial Court)	
7. Billingsgate Market		

# 2. Centre of Excellence roles

Centre of Excellence roles							
Sustainable Investment Property Specialist	Heat Decarbonisation Engineering Support						
– Arcadis <b>(in place)</b>	– Arcadis <b>(in place)</b>						
Resilience and Sustainable Design –	Energy Project Services (Housing) – Etude						
Arcadis (in place)	(in place)						
Building Management Systems Operations	Monitoring and Targeting – Team Energy						
– Schneider (in place)	Auditing (in place)						

# 3. Whole Life Carbon Assessments – Pilot projects

	Project Name	Areas (m²)	RIBA Stage	Project Type
1	15-17 Eldon Street & 1st-5th/6 Broad Street Place	10,000	RIBA 3	Office
2	Brewery Road - Refurbishment & Extension	3,931	RIBA 5	Office
3	Finsbury Garden Pavilion and Landscaping	600	RIBA 4	New Build
4	CoL Junior School Expansion	2,400	RIBA 4	School
5	COLPAI - CoL Primary Academy & Islington	8,500	RIBA 5	School

# 4.Key Risks

Risk	Mitigation
Delays in securing resource impacts project delivery.	Review of Centre of Excellence completed to address this issue. Use of flexible frameworks for Project Management resource. Utilising Lead Consultancy with backup resource available.
Funding gap emerges following investment grade proposals.	Existing funding allocation to be complemented with grant funding applications. Investigate energy performance contracts option to minimise capital investment.
Carbon grid factors adversely affected.	Keep in review BEIS grid factors and their impact on reach the 2026/27 Targets. Use PPA benefit and report Market based emissions as well as location based.
Major projects/programmes: The proposed further review of operational properties as part of the MTFP and Net Zero Budgeting.	Major programmes and projects may impact the decisions on CAS interventions or reduce the payback period if a decision is made to dispose or refurbish a building. In all cases full consideration should be made within the decision-making process. Additional carbon emitted from new developments limited by NZC design standards introduced and any subsequent asset disposals.

#### 5. Indicative Project delivery timescales

Site	Project	Surveys	-	IPG final	GW3/5 approval	Enter contract	Permissi ons Granted	Design Approve d	Install Start	Install Complet e
	Pumps upgrades	Complete	Complete	Jun-23	Jun-23	Jul-23	N/A	Jul-23	Aug-23	Aug-23
	Ventilation EC Fans	Complete		Jun-23	Jun-23	Jul-23	N/A	Aug-23	Sep-23	Nov-23
Barbican Arts	Lighting - Back of House	Complete	Complete	Jun-23	Jun-23	Jul-23	N/A	Aug-23	Sep-23	Nov-23
Centre	Specialist Lighting	TBC	TBC	TBC	TBC	TBC	TBC	TBC	TBC	TBC
	Lighting upgrades	Complete	Complete	Jun-23	Jun-23	Jul-23	N/A	Aug-23	Sep-23	Nov-23
Guildhall	GYE EC Ventilation Fans	TBC	TBC	TBC	TBC	TBC	TBC	TBC	TBC	TBC
Tower Hill Coach & Car Park	Lighting and ventilation	Complete	Complete	May-23	May-22	Jun-23	Jul-23	Aug-23	Sep-23	Nov-23
Multiple	BEMS Optimisation	Jun-23	Jun-23	Jul-23	Aug-23	Sep-23	N/A	Dec-23	Dec-23	Jun-24
London Metropolitan Archives	LMA Solar PV Range of M&E upgrades, incl.	Apr-23	Apr-23	Jun-23	Jul-23	Aug-23	Sep-23	Oct-23	Jan-24	Mar-24
Mansion Hse	ASHP	Jun-23	Jul-23	Jul-23	Jul-23	Aug-23	Oct-23	Dec-23	Feb-24	May-24
Epping Forest - Warren	Biomass boiler, pumps, lighting	Jun-23	Jul-23	Jul-23	Jul-23	Aug-23	Oct-23	Dec-23	Feb-24	May-24
Walbrook Warf	Range of M&E upgrades, incl. ASHP	Jun-23	Jul-23	Jul-23	Jul-23	Aug-23	Oct-23	Dec-23	Feb-24	May-24
3 no. Open Spaces s	Solar PV and other measures	Jul-23	Aug-23	Aug-23	Sep-23	Oct-23	Dec-23	Dec-23	Feb-24	May-24
GSMD (Silk St & Milton Ct)	Range of M&E upgrades	TBC	TBC	TBC	TBC	TBC	TBC	TBC	TBC	TBC

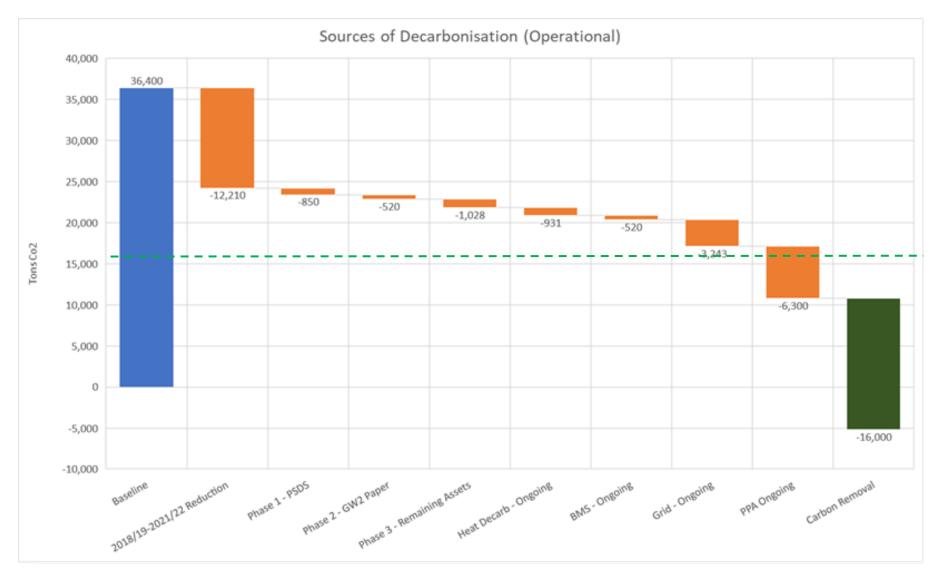
#### 6. Anticipated energy and cost savings from energy conservation measures implemented/planned

Project	Total Energy savings	Annual cost savings (23/24 energy prices)		
	kWh/yr	£		
PSDS Programme				
PSDS RA-W Barbican Arts Centre	2,838,978	£443,518		
PSDS RA-W Silk Street (GSMD)	644,064	£105,848		
PSDS RA-W Milton Court (GSMD)	540,326	£95,884		
PSDS RA-W Sundial Court (GSMD)	257,836	£53,196		
PSDS RA-W John Hossier Anexe	20,057	£4,814		
PSDS RA-W Guildhall Complex	584,700	£122,929		
PSDS Guildhall Ventilation	2,445,371	£341,040		
PSDS Guildhall Chilled Water Mods	160,551	£38,532		
PSDS LMA Ventilation	62,410	£14,978		
TOTAL	7,554,292	£1,220,738		

#### 7. CAS Phase 1 Capital Programme – Indicative Cost, Energy and CO₂ Savings

Site	Project	Energy savings (kWh/yr)	Energy savings (£/yr)	2027 Projected carbon savings (tCO2e/yr)
	Pumps upgrades	434,717	7,928	43
	Ventilation EC Fans	206,123	49,470	28
Barbican Arts	Lighting - Back of House	152,227	36,534	21
Centre	Specialist Lighting	87,185	20,924	18
	Lighting upgrades	130,677	31,363	32
Guildhall	GYE EC Ventilation Fans	60,585	14,540	67
Tower Hill Coach & Car Park	Lighting and ventilation	230,724	55,374	5
Multiple	BEMS Optimisation	395,334	53,699	23
London Metropolitan Archives	LMA Solar PV	39,511	9,483	12
Mansion Hse	Range of M&E upgrades, incl. ASHP	999,411	99,026	8
Epping Forest - Warren	Biomass boiler, pumps, lighting	26,723	11,120	180
Walbrook Warf	Range of M&E upgrades, incl. ASHP	375,476	42,768	20
	Solar PV and other measures	112,134	26,912	66
GSMD (Silk St & Milton Ct)	Range of M&E upgrades	166,411	39,939	15
	Total	3,417,238	499,079	538

#### 7. Waterfall chart showing the impact of interventions (including grid decarbonisation) on achieving the 2027 Scope 1 & 2 target



Carbon reduction target (16ktCO2)

# Agenda Item 17

<b>Committee(s):</b> Operational Property and Projects sub-Committee – For Information Policy and Resources Committee – For decision Finance Committee – For decision	Dated: 03/07/2023 06/07/2023 18/07/2023
<b>Subject:</b> Project Governance Review – key findings and proposals for new approach	Public
Which outcomes in the City Corporation's Corporate Plan does this proposal aim to impact directly?	1-12 (All)
Does this proposal require extra revenue and/or capital spending?	Y
If so, how much?	£550,000
What is the source of Funding?	Transformation Fund carry-forward
Has this Funding Source been agreed with the Chamberlain's Department?	Y
Report of: Chief Operating Officer	For Decision
<b>Report author:</b> Genine Whitehorne, Commercial Director and acting Project Governance Director, COO	

#### Summary

The Project Governance review was commissioned by the Operational Property and Projects sub-Committee (OPPs) and approved by the Policy and Resources Committee in October 2022. The review was a direct response to a commitment by Members to address the persistent issues in relation to lack of proportionality, clarity and understanding of existing policy and processes. The review aimed to assess existing governance arrangements and to recommend a future approach that would support an effective and proportionate governance and assurance framework for the delivery of projects across the Corporation and the institutions. The scope of this review included both corporate projects and major projects focussing on operational management and decision-making at officer level.

This report sets out the findings of the review and the proposal to introduce a portfolio management approach that provides greater assurance to Members regarding the delivery of strategic objectives, allocation of resources and management of strategic risks and issues. This approach is intended to provide cohesive oversight of all Corporation project activity allowing Members with visibility of the performance and associated risks across the entire project portfolio for the first time. This will allow for more effective challenge and scrutiny thereby ensuring project delivery aligns with strategic and investment priorities.

The proposals set out in this report, represent a significant shift in approach for the Corporation. At the heart of the proposals is the recognition of the need to ensure business and operational processes are robust, to enable a shift in Member focus from operational detail to outcomes and strategic oversight in support of the TOM principles and Member/Officer charter. The new approach will enable Members to focus on the most complex activity whilst being assured that effective operational

procedures are in place to manage more routine activity. This will result in a reduction in the total number of projects in the Corporation's portfolio. However, Members will retain oversight of roughly £2bn or 80% of the total project portfolio value. The proposed changes have been designed to ensure best value through project delivery and to ensure issues of affordability and financial sustainability are considered at the outset of any project. The proposals aim to bring us in line with recognised best practice and to ensure more effective and efficient use of resources including both Officer and Member time.

If approved, the first phase of implementation will focus on establishing strong foundations for developing the portfolio model over time. This includes ensuring the integrity of our data, developing the project management system and, establishing the Enterprise Portfolio Management office. This phase will also include work to map and test proposed operational processes and to undertake the detailed update of the Project Procedure. During this time, Officers will work with colleagues to understand implications for specific areas of the Corporation, such as Investment Property Group, to ensure conversations regarding increased agility in delivery is aligned with the development of the Project Procedure.

The scale of the Corporation's ambition is huge and it is right that we assess our operational practices and policies to ensure they live up to that ambition. If approved, implementing the proposals will require a long-term commitment to continuous improvement and culture change. The proposals include a series of qualitative and quantitative measures to assess impact and to ensure the intended benefits are realised.

The scope of the review was amended, by the Policy and Resources Committee, in March 2023 to include assessment of existing Member governance (i.e. committee structures). The findings and recommendations regarding Member governance are subject to a separate report on the agenda. Whilst the review of Member governance has been carried out independently, it is important that the relationship and interdependencies of the approaches set out across the two reports are understood. The recommendations in this report however are agnostic of Member governance arrangements.

Members are asked to note that it is intended to make use of the Town Clerk's transformation fund to implement the proposed changes and to meet the first year's operating costs. This has been approved, in principle, by Officers but is subject to the Chamberlain's further engagement with the Chairman and Deputy Chairman of the Policy and Resources Committee.

#### Recommendation(s)

Members are asked to:

Note

- the findings of the externally-led Project Governance Review set out in this report and in Appendix 1.
- proposals for the creation of an Enterprise Portfolio Management Office as part of an integrated Commercial, Change and Portfolio Delivery directorate

and the subsequent merger of the existing Commercial Director role with the Project Governance Director role, which has been covered by the Commercial Director since the TOM changes (01/04/2022).

Policy and Resources Committee are asked to endorse the following recommendations for onward approval by the Court of Common Council:

- Approve option 4B of this report for the development of a portfolio management framework including the new definition of projects and programmes (as set out in paragraph 19).
- Note the current Project Procedure will be retained for a period of 3-6 months whilst detailed design work is undertaken and the final version of the new Project Procedure will be presented to Members for decision.
- Delegate authority to the Town Clerk, in consultation with the Chairman and Deputy Chairman of Policy and Resources, to amend the current project procedure to incorporate the temporary measures previously approved by the Operational Property and Projects sub-Committee, namely delegation to (approved and trained) Officers to approve project-related decisions up to £1m for corporate projects and to descope routine procurements from the Project Procedure
- Note the implementation plan set out in Appendix 3.

Finance Committee are asked to agree the following recommendations:

• Authorise the Chamberlain to amend the Financial Scheme of Delegation and Finance Regulations, as necessary to implement the recommendations contained in this report once approved.

# **Main Report**

# Background

- 1. The Corporation has an ambitious portfolio of projects and programmes to deliver to achieve its strategic objectives. Effective project governance has an important role to play to ensure planned activity delivers the intended benefits, represents best value and supports effective financial controls.
- 2. The Corporation's approach to project and programme management has evolved over time, with the governance last reviewed in 2018. Since then, there have been a number of special arrangements put in place. These include the Investment Property Group (IPG) expedited process, the CLS schools' pilot, and the regular maintenance process. However, the definition of what constitutes a corporate project has remained fairly broad, and therefore continues to include non-project activity such as procurement and other low value activity that should be considered as business as usual. Conversely, it does not include resource or change projects which do not involve capital funding but are nonetheless of strategic importance, scale or complexity.
- 3. The Operational Property and Projects sub-committee was constituted in May 2022 as a result of the Governance review. This new sub-committee took on the remit of three (previously separate) committees. With very low project thresholds (£50k for capital projects), it was recognised that the sub-committee

would not be able to manage the volume of business presented at each meeting or to provide meaningful scrutiny in a way which adds value and, as such, a temporary delegation to Chief Officers of £1m was agreed subject to them completing appropriate training. At this time there were 340 live projects on the corporate project management system.

- 4. Major Projects, defined as projects over £100m in total value, are governed by a separate sub-Committee, the Capital Buildings Board. These projects are not subject to the Project Procedure, sit outside of the gateway process and are supported by a dedicated Major Projects Office (MPMO), part of the Project Governance directorate. Major projects are, by definition, high value and complex programmes that carry significant project delivery and reputational risks if not effectively managed. There are currently three major projects in delivery (Museum of London enabling works, Salisbury Square Development and, the Markets Co-location Programme) and a potential further two major projects in development (Barbican Renewal and the Guildhall Masterplan).
- 5. Given the importance of ensuring effective project delivery, it was therefore considered essential to carry out a comprehensive review in order to recommend a new industry standard/best practice approach.

# **Current Position**

#### Approach to the review:

Phase	Timeframe	Area of focus
Phase 1	Dec 22 – Feb 23	Independent external review and
		validation of internal observations
Phase 2	Mar 23 – May 23	Design of new approach based on
		recommendations from Phase 1

6. The review was split into distinct phases:

- 7. Please note the timelines above differ from those set out in the original report to OPPs and P&R in late 2022 due to a delay with the commissioning process, capacity issues within the Project Governance division and the change to the terms of reference scope and the subsequent need to align formal reporting to Members with the independent work on Member governance.
- 8. In order to manage capacity whilst the review was underway, OPPs approved temporary changes including; a temporary delegation of £1m to trained¹ Chief Officers and nominated directors; descoping of routine procurements and, the continuation of the interim leadership arrangements for the Project Governance division.

#### Findings of the review:

¹ officers were required to complete specially commissioned Senior Responsible Officer (SRO) training in order to make use of the delegation.

- 9. RedQuadrant (RQ), a consultancy company, was commissioned to undertake the review in order to ensure objectivity, to draw on industry standards and identify best practice from other comparable organisations. The review included desktop analysis of relevant Corporation policies, review of project reports, key documentation, project system and risk register supported by 121s and workshops with key officers from across the Corporation and a survey focussed on skills and capability.
- 10. RedQuadrant's summative report is provided in full as Appendix 1. A summary of their findings is set out in the table below. Please note that much of the narrative set out in the table below has been taken verbatim from their report.

RQ findings	How this affects COL effective project delivery
Low thresholds	Inefficient and often includes operational business as
	usual activity
Unsuitable definition of	The existing definition of a 'project' as anything that
a 'project'	results in 'tangible physical deliverables' suffers from
	being simultaneously too wide (since e.g., procurement
	activities end up defined as 'projects') and too narrow
	(since resource based or change projects do not meet
A frequencies disperticies	this definition of 'project')
A fragmented portfolio	There is no central location which oversees all projects within the City or that allocates effort and resources
	according to Corporation priorities. Project proposals
	which don't meet the existing definition of 'project' may
	thereby go unfunded or underfunded (despite meeting
	Corporation priorities). Alternatively, they may end up
	funded piecemeal without oversight, which risks
	accumulating hard-to-track expenditures for projects
	that do not meet Corporation priorities.
Lack of clarity on project	Across the Corporation, there is an inconsistency in
roles and	how key project roles are established, as well as a lack
responsibilities	of understanding regarding the purpose of such roles.
Assurance/risk	The greater the proportion of decisions put to the
management	Committee, the greater the proportion of Committee
	time spent on operational issues and approving minor expenses. This in turn severely decreases the amount
	of time available to focus on the kind of strategic issues
	and oversight of risks.
Budget allocation and	Delegation to Project Managers is minimal. They must
drawdown	seek Committee approval to access (already approved)
	project budgets, even for low-value sums. They cannot
	move project funding across workstreams, within the
	same project, without seeking Committee approval first.
	Project Managers experience these restrictions as
	disabling, as a barrier to effective and agile
	management of operational risks. The status quo
	frustrates Project Managers even as it exhausts the
	Committee.

Strategy and vision	There are inadequate or inconsistent processes in place for project selection, prioritisation, and resource allocation. There is an overly broad definition of 'project' and no clear and consistent framework for ensuring that there is distinction between programmes and projects, and that these are systematically prioritised to deliver the greatest benefits against strategic objectives
Governance and oversight	Governance responsibilities are disproportionately placed with Members rather than Officers. The limited delegation to Officers, coupled with a lack of clarity on project roles and responsibilities, has led to projects requiring additional oversight to compensate. This is a vicious cycle, which leaves Officers without the necessary powers, and Members without the necessary time, to do their respective jobs effectively.
Management and capability	The Corporation requires a deeper understanding of best practices for project and programme management, and to develop capability and skills particularly in the latter. This lack of consistency in the way that projects are managed, as well as to limited or unclear processes for project and programme governance, risk and assurance and benefits management is further exacerbating the issues identified.

- 11. These findings were not unexpected and validated the decision by OPPs to undertake a review into existing arrangements. The findings built on observations set out in a number of previous reviews including:
  - The review of Corporation governance undertaken by Lord Lisvane recommendations
  - Internal audit reviews a series of reviews carried out across 2021 and 2022 by Internal Audit to examine the adequacy and effectiveness of governance arrangements in place across the City Corporation's portfolio of Major Programmes
  - Maturity assessment carried out by the Chief Operating Officer in September 2021 and validated by the assessment of the acting Project Governance Director in May 2022.
- 12. Other significant issues that have been identified by officers involved in project delivery include:
  - Ambiguity regarding governance in early stages for potential major projects with limited established governance for feasibility and business case development.
  - Focus on capital delivery with limited view of wider project outcomes and interdependencies
  - Concerns regarding resourcing of projects, insufficient capacity included as part of project initiation process.
- 13. A recurring issue that has arisen during conversations with both officers and Members, is the insufficient assessment of required capacity as part of the

project initiation process including, not only, dedicated project delivery resources but capacity required from key corporate services such as finance, procurement and legal services. A strengthened focus on business case development will help to address this issue.

#### Response to the review:

- 14. It is clear that the Corporation's current approach is inadequate and does not live up to the scale of Members' ambitions. As a leader of industry and a public sector body, it is important that our operations and business practices are fit for purpose and deliver best value. Issues regarding organisational project management capability and capacity have also been identified as key risk on the Corporation's risk register (CR33). It is important that these issues are now addressed and not allowed to persist.
- 15. The remainder of this report will set out the recommended approach, and investment required, to deliver an effective portfolio management approach across the Corporation. Whilst we have needed to undertake comprehensive design work to turn the RedQuadrant recommendations into a proposed model, we have also taken the opportunity to implement immediate changes to maximise quick wins and to create testbeds for more fundamental changes. This proactive approach has already begun to deliver benefits and has ensured that no momentum has been lost following the review stage. The improvements implemented include:
  - The development of a Senior Responsible Officer (SRO) agreement document based on central government standards. This has been prototyped with the appointment, by Members, of the Chief Operating Officer as the Markets Co-location Programme SRO
  - The introduction of a monthly major programmes dashboard reported to Capital Buildings Board (and on a quarterly basis to Policy & Resources Committee)
  - Closer working between the Corporate PMO and the MPMO to build greater resilience across the now combined teams
  - Additional training for MPMO analysts on Portfolio, Programme and Project Management (P3O).
  - The appointment of a Future Police Estate Portfolio Manager to begin developing a strategic portfolio that brings together all the critical projects and programmes across COL and COLP that are central to the successful delivery of new police accommodation
  - The commencement of the Chamberlain's finance transformation programme with a specific focus on improving the capital finance processes and decoupling project governance from financial controls

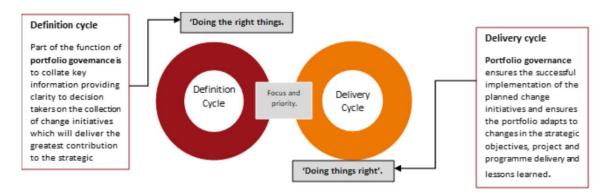
# Options

16. Option 1 - Do nothing – the Corporation could continue with the status quo and accept the limitations and risks this presents. This option requires no additional investment. **Not recommended.** 

- 17. Option 2 Limited review of the Project Procedure the Corporation could update the Project Procedure in order to review current thresholds to bring greater proportionality to the existing approach. This would address a limited number of issues identified in the review but not introduce a portfolio management approach. Significant risks regarding strategic alignment of investment with priorities, lack of capacity and capability to deliver projects, fragmented oversight of the total portfolio and, a lack of strategic focus for Member oversight would continue. Limited additional capacity may be required to deliver this option given that the lack of resilience across the PMOs would continue. Not recommended.
- 18. Option 3 Limited review of the Project Procedure and increase in capacity in the PMO/MPMO This option builds on the previous one by attempting to increase the capacity and resilience in the PMO combined team. This would require some investment to right-size the team but would not address the issues regarding the fragmentation of the portfolio and the lack of coherent governance for major projects whilst in the early stages of feasibility. It would not address issues regarding assurance, Member strategic oversight or the alignment of investment with priorities. **Not recommended.**
- 19. Option 4 Adopt a portfolio management approach agree and implement the model set out in Appendix 2. This option would deliver significant improvements and provide greater assurance regarding the Corporation's ability to deliver its priorities. This option requires both short-term investment to support implementation and long-term investment to increase capacity and capability across the Corporation. **This option is recommended** and further options are provided below regarding the level of investment required.
  - Option 4A deliver the proposed changes (as set out in Appendix 2) within existing resources and limit ambitions to get to 'better' (highest level of maturity against the IPA model) in only three of the seven themes. This would not require additional capacity to deliver but would significantly impact the ability to deliver the changes at pace. It is likely that the timeline set out in the implementation plan would need to be adjusted to at least a five year timeline. External resources would still be required to support the system developments and the refresh of the PMA Academy, therefore this option includes an investment of c. £65,000 plus ongoing operational costs.
  - Option 4B deliver the proposed changes (as set out in Appendix 2) and engage interim project support to implement the changes. This would establish strong foundations and significant changes in year one and deliver sustainable improvements over a further two-year period. This requires additional capacity to deliver, and it is proposed to engage an interim project manager and PMO analyst for a period of 6 months to support the programme and ensure continued alignment with work in the Chamberlain's department. An outline implementation plan has been included as Appendix 3. This approach includes additional anticipated costs of £160,000. This option is recommended.

#### Proposals for the adoption of option 4

- 20. RedQuadrant recommended a comprehensive overhaul of the Corporation approach. At the core of the recommendations is the implementation of a Portfolio Management Framework, which consists of two portfolio management cycles: portfolio definition (structures and functions) and portfolio delivery (good governance for project and programme delivery). This Framework can be applied to the totality of the Corporation's portfolio including both capital and revenue projects of any size.
- 21. The framework can be described using two phrases:
  - 'Doing the right things' alignment with strategic objectives, allocation of resources in line with investment priorities and, management of benefits to deliver intended outcomes
  - 'Doing things right' effective governance and project management framework ensuring excellence in delivery



- 22. There are two major forms of change being proposed for the current projects ecosystem:
  - Changes to supporting structures and functions: The introduction of a Portfolio Board, repositioning of existing resources to establish an Enterprise Portfolio Management Office, EPMO, (fully resourced), and clarification of roles and responsibilities across different stages of project delivery.
  - Procedural changes: Changes to processes related to finance and risk management, definition, categorisation, tiering, reporting, roles and responsibilities, toolkits with standardised templates such as updated Business Cases based on industry best practice, systems, and a new gateway assurance process.
- 23. The proposals set out in this report have been developed to support Elected Members in their role as strategic leaders by providing greater assurance regarding the policies, processes and procedures that will underpin effective project delivery. The proposals also bring a renewed focus on developing the internal capabilities within the Corporation to provide Members with confidence in the ability of officers to deliver successfully.
- 24. It is important to note that a Portfolio Management Framework is more than the adoption of a new delivery standard. It is a total transformation that requires a change in culture, mindset, and processes across the organisation. Whilst the proposal to adopt a portfolio management framework is considered to be the right direction of travel for the organisation, it is essential to recognise the

substantial gaps that need to be addressed before embarking on this journey fully. The proposed approach to change management is set out in Appendix 5 of this report.

25. A detailed account of the proposed model is set out in Appendix 2. A summary of the key proposals is provided below.

#### **Definition**

26. We will establish a clear definition of a project, programme and, portfolio and how these differ from business as usual operational activity. The proposed definitions are in line with industry standards:

	What is it?	How is it managed?
Project	A series of tasks which need to be completed to achieve a specific outcome, requiring a set of inputs and outputs to reach a particular goal. (A project isn't something that is part of normal business operations (BAU))	Project management uses processes, methods and training, together with knowledge and skills of the project manager and team, to coordinate and deliver the required outputs
Programme	Programmes are a group of related and interdependent projects and change management activities that will deliver beneficial change	Programme management involves managing interdependencies across projects, prioritising and budgeting, and ensuring resource capacity and capability across the programme.
Portfolio	The aggregation of projects and programmes within an organisation aligned to strategic priorities	Portfolio management includes the selection, prioritisation and control of projects and programmes which are aligned with the organisation's strategy and objectives.
Business As Usual (BAU)	Activity that is part of normal day-to-day operations and all activity with a total value of less than £250k	Operational management is the management of those activities that create the core services or products provided by an organisation.

# **Thresholds**

27. It is proposed to set a minimum threshold of £250k for corporate projects. This is in line with existing thresholds for ring-fenced funding. This will mean activity below this value will usually be managed through operational management processes in line with the financial scheme of delegation. However, it is important to note that the proposals move away from tiering projects on value

alone and therefore some activity below £250k may be subject to project governance dependent on the outcome of the tiering process.

28. All projects will be assessed against three different tiering categories; tier 3 – routine projects, tier 2 - strategic and, tier 1 - complex projects. The proposed financial thresholds will be supported by an assessment of risk and complexity in order to agree the final tiering of each project. A summary of the key factors that will be used to assess the tiering of each project is provided in the following table:

Routine	<ul> <li>✓ Low value (£250k-£2m)</li> <li>✓ Aligns to strategic outcomes</li> <li>✓ Clearly defined delivery approach</li> <li>✓ Requires little innovation</li> <li>✓ Minimal impact on people</li> </ul>
Strategic	<ul> <li>✓ Mid value (£2m-£20m)</li> <li>✓ Contributes to strategic outcomes</li> <li>✓ Some uncertainty exists</li> <li>✓ Requires some technical innovation</li> <li>✓ Moderate impact on people</li> </ul>
Complex	<ul> <li>✓ high value (£20m+)</li> <li>✓ delivers strategic outcomes</li> <li>✓ complex to deliver</li> <li>✓ high levels of uncertainty</li> <li>✓ requires new or innovative practice</li> <li>✓ significant impact on people</li> </ul>

29. It is recognised that major capital infrastructure projects (likely to be in excess of £100m total project value), may require focussed scrutiny, strategic oversight of project delivery and, alternative methods of financing. Therefore, it is proposed to create a sub-set of tier 1 projects, referred to here as tier 0. The project and programme management requirements, as well as criteria for tiering, remain the same as the rest of the tier 1 (complex) projects, however, governance arrangements may differ, particularly if special purpose vehicles are developed.

# Portfolio Board

30. Introduce a Town Clerk-led Portfolio Board to provide collective Chief Officer responsibility of the corporate portfolio and to act as an effective gateway for member governance. This would require the increase of the level of officer delegations from the £1m temporary delegation to £5m for trained tier 1 SROs and the Town Clerk. This proposal would be supported by a robust assurance framework that ensures risks are effectively managed and that projects are escalated to Members through the early identification of potential performance issues. The Portfolio Board will be supported by a sub-group led by the Chamberlain focussed on co-ordinating affordability considerations, financial risk considerations, assessing impact on the Medium Term Financial Plan and advising on prioritisation in order to ensure financial sustainability.

# PPM framework

31. Introduce clear requirements for all project and programme management activity including defined project roles and required project documentation. This would be driven by the proposed Centre of Excellence and underpinned through a comprehensive learning and development offer.

# Refreshed Project Management Academy (PMA)

32. The findings of the capability survey (please see Appendix 5) found that whilst we have strengths in project management capability this is not distributed across the Corporation and we lack capabilities in programme and portfolio management. Therefore, it is proposed to update the PMA to address these areas and to identify priority learners to complete training. This would include a mandatory induction for anyone involved in project delivery including consultants and interims.

# Introduce an Enterprise Portfolio Management Office (EPMO)

33. Establish a professional and well-resourced team to support the development of the portfolio management approach, to provide challenge and assurance to support effective project delivery, to set the standards for PPM throughout the Corporation and, to provide leadership of the wider PPM community. See paragraphs 42-50 for more detail.

# What would this mean for the Corporation's project portfolio?

- 34. There are currently 355 projects on the corporate project system. Following an initial review, it is estimated that roughly 50% of these projects should be reviewed further as they are nearing closure or have been inactive for a significant period of time, and therefore should be closed and any remaining resources reallocated. It is important to note that this assessment has been undertaken by the PMO and may differ from the recommendations of individual project managers. This is due, in part, to the fact that services are not incentivised to close projects that have stalled, and, in the absence of a robust portfolio assurance framework, these projects have been allowed to drift. Therefore, it is anticipated that once we have implemented an effective portfolio management framework, supported by a well-resourced EPMO, challenge sessions can be held to review those projects that have been dormant for a significant period of time. This has the potential to reduce the size of our future corporate portfolio to around 200 projects (including the existing major programmes and future business change projects).
- 35. Under the new proposals activity under £250k will largely be descoped from project governance. There are currently 45 projects under this threshold. These 'projects' include activity such as:
  - Installation of car park and other signage at the Barbican
  - Refurbishment of the Guildhall Art Gallery cloakroom and toilets
  - Installation of water drinking foundations
- 36. In addition routine procurement activity (such as the leasing of 16 new Steinway pianos for Guildhall School of Music and Drama) is also currently subject to the Project Procedure. It is considered that the types of activity listed above is low risk and best managed through procurement governance at service level supported by robust operational procedures.

Breakdown of future portfolio:

- 37. Removing low value and BAU activity, leaves a potential corporate portfolio with a total value of c. £1bn plus the existing major programmes and the pipeline of transformation projects (yet to be identified).
- 38. The breakdown of the remaining portfolio is provided below. Please note that the validation of data held in the system and reconciliation with Oracle will be a priority for the first phase of implementation.

Tier	No. of projects	Total value (m)	Examples of projects in tier
Tier 3 - routine	61	£53.63	<ul> <li>Guildhall Event Chairs</li> <li>Tower Hill coach and car park LED lighting</li> <li>Windows and Common Parts Redecorations Programme - Windsor House</li> </ul>
Tier 2 - strategic	54	£385.4	<ul> <li>GSMD/Barbican heating, cooling and ventilation</li> <li>Blackfriars bridge parapet replacement and repainting</li> <li>Candlewick House, 116-126, Cannon Street, EC4 (IPG)</li> </ul>
Tier 1 – Complex	8*	£602.3*	<ul> <li>Refurbishment of Electra House, 84 Moorgate, EC2 Bridge House Estates (IPG)</li> <li>York Way Estate Housing Delivery Programme</li> </ul>

*The figures provided in this table, exclude the major programmes. With the addition of the major programmes, tier 1 increases to 11 live projects (with 2 in the pipeline), with a total value of c. £2.1bn. Under the proposed model, Members will have direct visibility and strategic oversight of that £2.1bn which represents roughly 80% of the overall corporate portfolio value.

- 39. The new approach will bring about a cohesive view of the Corporation's total project portfolio aligned around strategic priorities. This should remove the risks associated with the existing fragmented portfolio and remove any ambiguity regarding appropriate project governance. It will also create clear and measurable pathways from ideation through to delivery and, drive an enhanced focus on business case development ensuring focus on strategic alignment and prioritisation.
- 40. Currently, corporate projects are split into nominal tiers that determines the extent of the required project documentation. All projects have to go to committee for consideration regardless of the value (though there is currently some streamlining for light/regular projects which means gateways 3, 4 and 5 may be expedited). Complex/regular projects over £5m have to go to Court of

Common Council for approval. There currently is little proportionality built into the governance framework and strategic priorities risk being lost amidst the sheer volume of member reporting.

41. The proposed approach will result in all tier 1 projects being subject to Memberlevel governance, with challenge and scrutiny of lower tiers being led by officers and escalated to Members by exception.

# What will this mean in practice?

42. The following statements have been developed to illustrate what the intended outcomes are for different stakeholders. These statements will be used to develop the qualitative measures for assessing the success of our transformed approach:

	We
Elected Members	<ul> <li>Are able to focus on strategic priorities and provide oversight for the most complex projects/programmes</li> <li>Have visibility across the entire corporate project portfolio and understand the impact of this activity</li> <li>Are confident that we have the appropriate capacity and capability to deliver the ambitions of the Corporation</li> <li>Are confident that any potential issues or risks will be picked up by the corporate assurance framework and brought to Members with potential solutions identified</li> </ul>
Chief Officers	<ul> <li>Support Elected Members to provide strategic oversight and challenge across the Corporation's portfolio</li> <li>Empower and enable capable team members to do their jobs well</li> <li>Challenge each other to ensure investment aligns with priorities across departmental boundaries</li> <li>Proactively manage risks and identify solutions to emerging challenges</li> </ul>
Staff	<ul> <li>Are clear of our responsibilities in relation to managing projects and programmes</li> <li>Are trusted to use our skills and experiences to do our jobs well</li> <li>Have access to the tools, guidance, support and training needed to do our jobs</li> <li>Understand the Corporation's governance processes and feel that the organisation's procedures make it easier to get things done</li> </ul>
Public/ residents	<ul> <li>Are confident the Corporation's project activity is well managed and represents value for money</li> <li>Have visibility of the impact of public spending</li> </ul>
Internal and external audit	<ul> <li>Are able to take assurance from the work of the EPMO</li> <li>Can rely on the consistent application of agreed and robust governance arrangements for delivery of projects</li> </ul>

Have access to appropriate metrics to identify     avantions/poor compliance/potential project failure
exceptions/poor compliance/potential project failure
enabling targeted audit work to be initiated.

# **Organisational structure**

- 43. As aforementioned, the Corporation's project governance processes are currently supported by two separate Project Management Offices that were brought together in May 2022 as a result of the TOM.
  - The Corporate Project Management Office (PMO) responsible for the Project Procedure (aka gateway process), chairing the Corporate Projects Board and, supporting projects through the corporate governance and in to OPPs. This team is made up of two full-time equivalents (FTE) and is responsible for facilitating the successful delivery of 355 projects.
  - The Major Projects Management Office (MPMO) responsible for supporting the major projects portfolio (c. £1.5bn total value). This team supports the Capital Buildings Board and provides project support to all programmes. This team is made up of three FTE.

Current PMO and MPMO responsibilities

- 44. Due to the limited capacity within the teams, the primary focus of both teams is supporting project/programme leads to navigate the Corporation's governance and ensuring quality of reports presented to Members. There is also a significant amount of time dedicated to helping projects to engage with the capital finance process and to unblock payment issues.
- 45. The profile of time spent now and what it should look like in the future is set out in the table below:

Activity	Corporate PMO % time spent	MPMO % time spent	Future (EPMO) % time spent
Payments and invoicing	5	30	5
Project admin	5	20	5
Governance	75	15	10
Risk management	5	10	35
Progress reporting	10	25	10
Project assurance	0	0	35

A new integrated Commercial, Change and Portfolio Delivery division

46. Since April 2022 the Commercial Director has also fulfilled the role of acting Project Governance Director following the exit of the former Project Governance Director through the TOM process. This arrangement has helped identify and confirm benefits of integrating the two teams for the long-term and the teams will now be merged as an officer-level reorganisation to realise significant synergies between the function and responsibilities of the two service areas:

- The proposed changes to the Project Procedure (through the clearer definition of BAU), will result in less activity through project governance that will instead be picked up and managed through procurement governance.
- Integration provides greater assurance against the risk of activity being descoped from projects and not being picked up by procurement governance.
- The challenges faced by the two current teams in terms of developing more customer-focussed enabling functions are similar and many of the key stakeholders are shared.
- An integrated model represents better value for money as there is the opportunity to share a single director role and resources in areas such as data and analytics. There is also the potential to bring a far greater focus on understanding and communicating the impact of the Corporation's investments in a more radical and transformative way.
- The integrated service is better placed to articulate, champion and measure societal and environmental impact across contractual and project-related investments.

# Developing the portfolio management office

- 47. Best practice suggests that for a portfolio of circa 200 projects, 10-12 posts would be needed to properly administer and support this and the cost should represent roughly 3-5% of total financial investment. The proposed approach seeks to develop best value by integrating two existing divisions in order to share resource wherever possible.
- 48. Within the new model, the team will be working as the professional leaders of portfolio, programme and project management providing guidance, challenge and assurance to enable excellence in project management. The new Enterprise Portfolio Management Office (EPMO) will include the following functions:
  - Developing a Centre of Excellence a central hub setting the professional standards, capability, guidance, tools and templates for the Corporation
  - Portfolio management reporting, risk management, assurance checks
  - PMO project delivery support, project governance
  - Benefits realisation social value, benefits management
- 49. It is anticipated that the establishment for the new Division can be contained within the cost envelope available through existing local risk provision and project related funding on central risk. If this approach is supported by Members, detailed design of the structure will be progressed. Consultation with staff will be carried out as appropriate and if necessary, approval for specific roles will be sought from the Corporate Services Committee in line with corporate policies.
- 50. In addition to the core team, it is proposed to develop a resource pool of professional project managers that can be deployed to support corporate priorities. Instances when it may be appropriate to draw on resources from the corporate pool may be when departments who do not regularly undertake

projects require support to move from ideation to delivery or where, through the assurance framework, it is identified that there are significant issues with an existing project and additional capacity and/or corporate intervention is recommended as a solution.

51. The project managers in the resource pool will also be responsible for supporting the development of internal capabilities by taking on coaching roles and delivering learning opportunities. It is proposed to test this model for the first 18 months with three Corporate Project Managers to establish the working practices, develop criteria for deployment and to understand the potential return on investment in order to develop the business case for the longer-term development of the pool. The cost of the resource pool for one year is estimated to be £225,000 based on three grade F posts including oncosts.

# Approach to implementation

# Benchmarking our maturity

- 52. We have undertaken an assessment of our portfolio maturity against the government project delivery professional standard. The Corporation scores as 'in development', the lowest level of maturity across all seven themes set out in the standard. The proposals set out in this report (and the associated appendices), are designed to ensure we progress against all elements of the standard. It is important to acknowledge that the implementation plan set out is designed to develop sustainable improvements. Therefore, this is a long-term plan based on a comprehensive redesign supported by incremental and continual improvement. Our progress against the maturity model will be regularly monitored to ensure the intended benefits are delivered.
- 53. The graph below illustrates Corporation maturity now and maps out plans for development over the next three years.



54. As shown in the table, the priority areas of focus, for year one (set out in the attached implementation plan), are: governance and project delivery; leadership and capability and; programme and project management. The overall aim is to get to best in class across all themes by the end of year three which is considered an appropriate maturity level to reach given the size and scope of our activity.

Standard Theme	Now	12 months	24 months	36 months
Governance and project delivery	In development	Better	Best	Best
Leadership and capability	In development	Better	Best	Best
Portfolio management	In development	Good	Better	Best
Programme and project management	In development	Better	Best	Best
Planning and control	In development	Good	Better	Best
Finance and commercial	In development	Good	Better	Best
Solution delivery	In development	Good	Better	Best

# Phased implementation

- 55. It is proposed to take a phased approach to implementation with phase one changes aiming to go live in Jan 2024. The priorities for the first phase include:
  - Data integrity and validation (cleansing of data held in the project system and reconciliation with Oracle)
  - Upgrade of project management system
  - Establishment of EPMO and internal reorganisation
  - Detailed design and business process mapping
  - Updates to the Project Procedure
  - Updates to associated policies and procedures
  - Health checks on tier 1 projects
  - Transition of tier 1 projects to new model

Further details are included in Appendix 3.

56. In order to manage priorities whilst these changes are being implemented it is proposed to make permanent, the temporary measures approved previously by OPPs, namely the delegation to (approved and trained) Officers to approve project-related decisions up to £1m for corporate projects and to descope routine procurements from the Project Procedure. It is proposed to seek delegation to officers to make tactical changes to the Procedure to improve decision making in the interim.

# Investment required

57. The creation of the new division can be achieved within budgets that already exist on central and local risk. The intention is to combine these budgets and use the that to fund the new structure. However, as set out in the implementation options, in order to deliver the scale and pace of change needed, a one-off investment of £225k is required. Additionally, it is recommended that a corporate project management resource pool is developed to provide professional corporate support and intervention where required. This is proposed as a more cost effective model in comparison to interim resources where day rates are likely to be high (£700 per day and above). The internal resource pool will also better support the development of internal knowledge and capabilities.

58.	A summary of the investment required as a result of the proposals set out in
	this paper is provided below:

Investment	Cost	Туре
Portfolio management implementation plan	£225k	One-off
Sub-total	£225k	
Establishment of the new Commercial, Change and Portfolio Delivery division – core budget	No additional investment required	Ongoing
Corporate project management resource pool	£225k	Ongoing
Annual operating budget (includes licenses, training, system maintenance)	£100k	Ongoing
Sub-total	325k	
GRAND TOTAL	£550k	

# Managing the change

Effective change management will be key to ensure that the changes set out in 59. this report are achieved. This is a corporate wide change and whilst it will be led by the COO department, it is important that all parts of the Corporation buyin to the changes and develop a sense of ownership of these proposals. The benefits set out will improve the working experiences for all Corporation staff including those in our institutions and should help to make it easier to navigate corporate governance and processes.

- 60. The proposals include the strengthening and formalising of existing networks who will take a lead role in continuing to refine the proposals and implementing them. The key networks will include:
  - Project and Programme Management Community of Practice a virtual network of all officers across the Corporation involved in the delivery of projects and programmes. The network will provide a forum to share best practice, to seek peer support, to disseminate information and share learning opportunities.
  - Change Champions a network of change agents from across the Corporation sharing best practice, knowledge and learning.
- 61. Appendix 5 provides a summary of the intended change management approach.

# Measuring our success

62. Assessment of progress against the project delivery standard (as set out in paragraphs 53-54) will be used to measure improvements and to assess whether the Corporation is developing at the pace required. The qualitative outcome statements (set out in paragraph 42) will also be used in order to measure the impact of change on particular stakeholder groups. In addition the existing Project Governance division business plan identifies the following targets which we will aim to achieve in the first phase of the implementation plan (Q4 23/24).

#	KPI	Current Perform- ance	Direction of Travel/
			Target
1	Programme health check carried out on all major projects	New measure	100%
2	Named SRO on all major projects and high value corporate projects	New measure	100%
3	% of SROs who have completed SRO training	New measure	100%
4	% of dedicated PMs who have completed requisite training	New measure	tbc

# Key data

63. The Corporation has a project portfolio of over £2bn. This is currently split into corporate and major projects with limited oversight over the impact and delivery of the entire portfolio. There are 355 corporate projects, three major projects and two additional pipeline projects. No coherent corporate governance exists to manage business change activity and therefore it is unknown how many

strategic transformation projects are taking place or the quantum of investment in this type of activity.

# **Corporate & Strategic Implications**

- 64. Strategic implications The Corporation's strategic priorities are achieved through the successful delivery of corporate and major projects. The proposals set out will provide assurance of the Corporation's approach and ensure alignment with strategic priorities.
- 65. Financial implications The proposals set out in this report will help to provider greater assurance regarding the value for money of project delivery. The strengthening of the approach to the development of business cases and introduction of greater rigour in regard to project forecasting will inform considerations regarding the affordability of the capital programme. Moving to industry standards and evidencing increased corporation maturity in portfolio management, will be important to support any alternative means of financing including the set-up of special purpose vehicles or joint ventures.
- 66. Resource implications the proposals set out will require a focus on training and development for everyone involved in delivering projects across the Corporation. Proposals for the development of the Project Management Academy are set out in Appendix 2 and the approach to staff engagement is set out in Appendix 5. The proposals for the integration of the Commercial and Project Governance divisions will be managed in line with corporate HR policies and will include engagement with all affected individuals. It is not anticipated that the integration of the two teams will lead to any adverse implications for staff members. An equalities impact assessment will be conducted on the proposals for the new structure.
- 67. Legal implications none.
- 68. Risk implications the approach set out in this paper is intended to support a more effective and consistent approach to risk management across all projects. The proposals are underpinned by the development of a robust assurance framework aligned to the internal audit approach. The proposals set out also seek to directly address the existing corporate risk CR33.
- 69. Equalities implications An initial equality analysis test of relevance has been undertaken and has shown no negative implications associated with the proposals set out in this report. The proposals are intended to ensure that consideration of equalities implications are embedded in our project and programme management approach and all new guidance and templates will be developed in consultation with the Equalities team.
- 70. Climate implications none.
- 71. Security implications none.

# Conclusion

72. Our current approach puts our ambition at risk. The Corporation has a generational opportunity to make a real and lasting difference in the Capital and beyond, but this requires us to think differently and to invest in developing the professionalism and capabilities needed to deliver.

# Appendices

- Appendix 1 RedQuadrant summative report
- Appendix 2 outline project governance framework
- Appendix 3 proposed implementation plan
- Appendix 4 RedQuadrant capability survey finding
- Appendix 5 approach to change management
- Appendix 6 case studies highlighting challenges with existing governance approach

# **Background Papers**

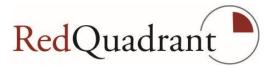
Project Governance Review OPPs (cityoflondon.gov.uk)

# Genine Whitehorne

Commercial Director and acting Project Governance Director

T: 07749 402140

E: genine.whitehorne@cityoflondon.gov.uk



# **Project Governance Review**

# **City of London Corporation**

Report from RedQuadrant

© Red Quadrant

# Contents

1. Introduction	
1a why are we doing the work (drivers for change and context)	
1b. What have we been commissioned for	
1c. Anticipated benefits/objectives	4
2. The current state	5
2a summary of approach and problem statements	5
3. The approach to the review (what we have done)	7
3a. How we have engaged with stakeholders on journey	7
4. Our findings	
4b. What requires improvement	
5. Our proposed model	
5a. Summary overview of how it works.	
5b. Proposal and Recommendations - structure and processes needed to make it wo	rk17
5c. Benefits of the structure and how it mitigates problem statements.	24
6. Implementation plan	
6a. What you need to do	26
6b. Order to do it in	27
7. Annex	
1. Proposed - Roles and Responsibilities.	
2. Proposed - Governance, Assurance and Risk Management	
3. Proposed - Definition and Categorisation	
4. Proposed - Skills and capability	
5. Proposed - Community of Practice (PLG)	40
6. Proposed - funding for PM Academy	42
7. Proposed - PPM Systems and Reporting	44
Figure 1 - Portfolio Operating Model	45
Figure 2 - Portfolio Building Blocks	46

#### 1. Introduction

#### 1a why are we doing the work (drivers for change and context)

In recent years the Corporation has undergone several changes and developments in its approach to project management. In 2018, the Costed Risk provision was introduced, as was the Project Management Academy, and a revised version of the Projects Procedure. This was then followed by the implementation of the new TOM, which was followed by a number of special arrangements, including the Investment Property Group (IPG) expedited process, the CLS schools' pilot, and the regular maintenance process.

However individually justifiable these changes and developments have been, the cumulative effect has been a fragmentation of approaches, with common practices within individual departments becoming inconsistent both with each other and with the City's Projects Procedure.

This inconsistency has given rise to numerous issues, as identified by the Corporation in the original review brief. As you recognise in that document, it has become necessary to ensure that official procedures and actual practice align with each other, and that both are in alignment with the best interests of the City of London Corporation.

The current approaches create risk for the Corporation, particularly in the following areas:

- The provision of consistent governance and oversight,
- The alignment of scarce resources to strategic objectives,
- Ensuring operational efficiency and effectiveness

Oversight is especially key here. The Corporation currently has no single or collective point of oversight for their projects, and no robust framework to help ensure successful delivery of those projects. This needs to be remedied if the Corporation is to make headway in addressing the other issues they face.

#### 1b. What have we been commissioned for.

RedQuadrant have been commissioned to undertake a review of the Corporation's entire project ecosystem, including projects of all sizes, whilst recognising proportionality as a key principle. The objectives of the work were not to duplicate the scope of the recent Member governance review and therefore, the agreed Committee structure OPP sub- Project Governance Committee and Capital Buildings Board) will remain unchanged (other than potential recommendations to refine Committee terms of reference to include any changes necessitated by the final agreed operating model).

We were commissioned for a total period of 2 months and the work was broken down:

Stage A&B Initiation and Review
Stage C Develop and Enhance - including contact with parallel disciplines.
Stage D Finalise and develop implementation plan.
This report summarises the overall findings and recommendations emerging from this review.

An important point of clarification regarding this commission: as we discovered during the course of this review, <u>there is a confusion of terminology embedded in the system that the Corporation is</u> <u>currently using</u>. What the Corporation refers to as its existing "projects procedure" is in fact an amalgam of what the industry standard would recognise as a 'projects procedure' *and* an 'operational procedure', with the latter being concerned with business-as-usual activity. The industry standard terms as they appear in the APM glossary are as follows:

Business-as-usual	An organisation's normal day-to-day operations. Also referred to as steady state.
Operations management	The management of those activities that create the core services or products provided by an organisation.
Project	A unique, transient endeavour undertaken to bring about change and to achieve planned objectives.

Please note that RedQuadrant has (only) been commissioned to undertake a review of the Corporations *project* ecosystem, including its *projects* procedure. It has not been commissioned to undertake a review of the Corporation's operations procedure. Engaging with any aspect of this would have been squarely beyond the scope of our commission and therefore an inappropriate use of the allotted time.

During the course of this review, we have addressed the confusion of terminology in the Corporation's existing system, illustrated how to disambiguate 'projects' from 'business as usual', and explained the importance of doing so.

A natural result of all of this is that not everything which the Corporation is accustomed to categorising as part of their "projects procedure" is covered by the review or this report. This is not a failure but a feature. Again, we are illustrating what the appropriate boundaries of a project ecosystem are, which is the most valuable insight we can offer the Corporation.

# 1c. Anticipated benefits/objectives

The proposed portfolio management operating model stands to provide considerable improvements to the financial efficiency of the organisation. It offers consistency in the project delivery approach, which can lead to improved efficiency and reduced costs over time. It offers clarity, and therefore to improved alignment between project goals and strategic objectives, which can ultimately lead to better value for money. It offers flexibility, enabling the Corporation to respond more effectively to shifting market conditions and to opportunities, which can improve the overall value delivered by the portfolio. Above all, it offers the opportunity for continuous improvement, via a centre of excellence devoted to the continual refinement of the operating model, ensuring that the Corporation can continue to deliver value over time.

#### 2. The current state

#### 2a summary of approach and problem statements

The overarching issue is that the "projects procedure" as it stands acts as the core process for all activity in the Corporation, covering business as usual activity, projects, and major programmes. As such, it is not properly what the industry standard would call a "projects procedure" at all, but rather, an amalgam of a projects procedure and an operational procedure. This "one size fits all" approach has contributed towards some of the following issues, as identified in the original brief:

- LOW THRESHOLDS. The existing threshold of £50k for capital projects means that any undertaking above that figure must be submitted to Operational Property and Projects subcommittee. This committee formed in May 2022 to take over what was formally the remit of three separate sub-committees. The sheer quantity of capital projects which fall above the £50k threshold has meant committee members facing agenda packs of more than 600 pages, plus supplementary pages. This is not conducive to efficiency. This issue is aggravated by the fact that the Corporation has an unsuitable definition of a 'project'.
- 2. AN UNSUITABLE DEFINITION OF A 'PROJECT'. The existing definition of a 'project' as anything that results in 'tangible physical deliverables' suffers from being simultaneously too wide (since e.g., procurement activities end up defined as 'projects') and too narrow (since resource based or change projects do not meet this definition of 'project'). On the one hand, this adds to the aforementioned problem of the overstuffed agenda packs. On the other, it excludes transformational activities or change projects from the usual capital projects procedures. Not only is it unclear how such projects (for they are *projects*) are to obtain funding, but it is also unclear how their associated business plans are to be subjected to appropriate scrutiny or their outputs evaluated. This contributes towards the problem of the Corporation's fragmented portfolio.
- 3. A FRAGMENTED PORTFOLIO. As we can see, the guidelines and procedures as they stand only capture conventional capital projects. They do not capture transformational activities or change projects. As a result, there is no central location which oversees *all* projects within the City and allocates effort and resources according to Corporation priorities. Project proposals which don't meet the existing definition of 'project' may thereby go unfunded or underfunded (despite meeting Corporation priorities). Alternatively, they may end up funded piecemeal without oversight, which risks accumulating hard-to-track expenditures for projects that do not meet Corporation priorities. The latter concern would be largely mitigated if there was a clear, agreed understanding of what decisions (budgetary and otherwise) lie within the remit of particular roles within the Corporation. Unfortunately, as things stand, there is a lack of clarity on project roles and responsibilities.
- 4. LACK OF CLARITY ON PROJECT ROLES AND RESPONSIBILITIES. Across the Corporation, there is an inconsistency in how key project roles are established, as well as a lack of understanding regarding the purpose of such roles. In such circumstances, it is easy for

Project Managers to either overestimate or underestimate the appropriate scope of their role. Current procedures focus on mitigating the former error, by pushing as many financial decisions as possible up the ladder. But underestimating the appropriate scope of the Project Manager's role carries serious risks of its own and in fact reduces the Corporation's capacity for effective assurance/risk management.

- 5. ASSURANCE/RISK MANAGEMENT. The greater the proportion of decisions put to the Committee, the greater the proportion of Committee time spent on operational issues and approving minor expenses. This in turn severely decreases the amount of time available to focus on the kind of strategic issues and oversight of risks, as well forcing under-developed business cases into funding assumptions too early. Delegating operational issues and decisions regarding minor expenses to Project Managers would address this issue. Unfortunately, as things stand, delegation to Project Managers is minimal, owing to the current structure of budget allocation and drawdown.
- 6. BUDGET ALLOCATION AND DRAWDOWN: As things stand, delegation to Project Managers is minimal. They must seek Committee approval to access (already approved) project budgets, even for low-value sums. They cannot move project funding across workstreams, within the same project, without seeking Committee approval first. Project Managers experience these restrictions as disabling, as a barrier to effective and agile management of operational risks. The status quo frustrates Project Managers even as it exhausts the Committee.

#### 3. The approach to the review (what we have done)

#### 3a. How we have engaged with stakeholders on journey

In approaching this review, we have drawn on our understanding of a range of industry standard approaches, including portfolio management, as well as on our considerable practical experience of delivering portfolio management frameworks. This has enabled us to de-risk the required changes, and to tailor our approach and recommendations to your specific context.

It should be noted that our engagement with the original project team was interrupted by a team change at the Corporation, which occurred partway through the project. This has resulted in a situation where the new members of the Corporation team are still getting up to speed with the required changes as RedQuadrant's involvement draws to a close. Whilst this is less than ideal, we are confident that the clarity of our recommendations, in combination with the consistent team leadership provided by Genine Whitehorne will suffice to ensure that the programme retains the necessary momentum.

Over the past few weeks (with a total of 2 months allocated to the project), we have conducted the review in the following stages. Prior to the start of each stage, we have engaged with the Corporations project team and SRO to discuss, refine, and agreed both the approach to the stage work plans and the key deliverables/outputs required at the end.

#### Stage A: Initiation; and B: Review and evaluate current designs.

The initial desktop phase of the process was of necessity a short one. It was further constrained by the need to be mindful of morale. Owing to the recent TOM and the governance review, the Corporation has experienced a number of significant changes in a very short period of time, some of which have been difficult and stressful. As a result, there was an understandable level of change fatigue amongst stakeholders, a reluctance to re-visit and discuss issues which may have already been discussed in relation to the TOM. Therefore, in order to minimise any negative impact on morale and thus maximise stakeholder engagement with the project, we focused our attentions on validating assumptions from the initial brief.

Our initial review was completed through engagement interviews and document review. We engaged with the following relevant stakeholders:

- Staff in project operational roles,
- Staff in governance roles,
- The PMO, and
- Senior Stakeholders

We made use of their insights in order to:

- understand and assess the current expectations of service delivery,
- identify and conform the specific requirements for the Corporation, and
- understand the current context for this project (including ambitions for the future),
- confirm non-negotiables.

We began by arranging a number of focussed sessions with sample representatives from a cross section of the organisation's ppm community. We conducted 1:1 engagement/ workshops with stakeholders at all levels. This included:

- Representatives from both the Corporate PMO and the Major Projects PMO,
- Representatives from the Corporate and Major Projects Programme,
- Project Managers from the following directorates:
  - o Environment,
  - o Surveyors,
  - Community and Children's Services

Our samples therefore reflected the breadth of specialisms and experience within the Corporation, placing us in the best possible position to understand concerns and to suggest improvements.

We took a blended approach, based upon a number of industry benchmarking standards, to support our independent evaluation and to use as a guide in conducting stakeholder interviews. In particular, we made use of the following tools:

- P3M3 A self-assessment questionnaire designed to explore and evaluate an organisations maturity and process capability with respect to, programme and project management.
- Infrastructure and Project Authority's (IPA) Project Routemap A support tool which provides practical advice based on learning from other major projects and programmes.

Themes	Description
1. Requirements	Delivering strategic project outcomes and realising the benefits
2. Governance	Establishing clear accountability and empowering effective decision-making
<ol> <li>Organisational design and development</li> </ol>	Organising the project team to deliver successfully
4. Risk Management	Managing uncertainties and opportunities
5. Delivery planning	Readying the project for transition into delivery

The themes we explored were as follows:

Stage C: Develop and enhance design.

During this stage, we focussed on identifying the Portfolio management operating model which would work best for your organisation, and how it would connect with your existing assurance processes.

As with the initial desktop phase, it was necessary to be considerate regarding stakeholder sensitivities arising from the recent work on the TOM. Therefore, it was agreed that the scope of this phase should be focussed on the 'to-be' model, rather than the more in depth 'as is' processes, with this knowledge being provided by the Corporations project team members. It was also agreed that we would revise our initially planned scope for stakeholder involvement in this stage. The original intention was to establish working groups of subject matter experts and wider stakeholders in

developing the building blocks for each of the identified deliverables. This was revised to a mixture of smaller focussed groups. 1:1 sessions and workshops in relation to each deliverable.

We also worked in parallel with the Chamberlains Transformation programme to understand key dependencies between the two work strands and ensure that these are captured in our recommendations.

The following list represents the key deliverables, or building blocks for which the revised approach, outputs and stakeholders were agreed prior to commencement:

- 1. Portfolio Definition new operating model
- 2. Portfolio Delivery (defining good governance for projects and programmes)
  - 2.1. Roles and Responsibilities
  - 2.2. Governance, Assurance and Risk Management Links to Chamberlains Transformation
  - 2.3. Definition, Categorisation and Tiering (to support portfolio prioritisation)
  - 2.4. PPM Systems and Reporting
- 3. Skills and Capability analysis
- 4. Community of Practice options
- 5. PM Academy funding options

(Our recommendations regarding each of these deliverables is explored in depth in section 5, below.)

We designed the blueprint for the above building blocks based on industry standards, and incorporated strong links with:

- MoP, the Portfolio Management Framework developed by the Cabinet Office,
- The IPA Routemap
- Government functional standards (which incorporate best practice Prince2 and MSP) for:
  - The Project Delivery framework,
  - The Project Capability framework.

Additionally, we worked alongside the Chamberlains Transformation programme and drew on lessons learnt from working with similar public sector organisations when making recommendations for a proposed Scheme of delegation, Costed risk.

The requirement for a summative report with recommendations on future design was merged into the next stage activity.

D) Finalise design and plan implementation

We have worked to finalise the design of the Portfolio management operating model into Blueprints templates and provided extra supporting information in the form of guidance, and tools.

- 1. Produce finalised design documents.
- 2. To engage with senior leaders to brief them on the future portfolio operating model.
- 3. Develop blueprint plans for adopting the new operating model with associated implementation timeframes.

We have presented our findings and recommendations on the proposed new Portfolio Operating model and enhanced Project and Programmes delivery cycle through a number of engagements with Senior Stakeholders, Project managers and to the PLG and Corporate Projects Board.

Coming to the end of our engagement, we have been introduced to the Corporations project team working on the Net Zero Climate strategy. Through a number of engagements, we have briefed them on the changes to the Portfolio, programmes, and projects processes (Portfolio Ecosystem) which align to government functional standards that we have recommended. In addition to the, proposal to introduce more structured feasibility assessments (overseen by the Portfolio Board) which would include a number of impact assessments and the new Gateway Review process based on IPA (OGC) guidelines.

Finally, we have developed this summative report of our findings.

#### 4. Our findings

#### 4a. What works well.

We found significant strengths within the organisation which provide a foundation upon which to build. Above all, it's clear that you have dedicated and capable staff. Our survey showed a good level of project management skills and capability within the organisation, and most of the respondents would welcome career development at the City of London Corporation. This makes them an excellent workforce base to develop. Also demonstrative of the strength of the workforce is the excellent engagement we saw in the workshops and the 1-1's. Staff are clearly keen to give their views in and suggestions to improve the project management process. This is indicative that you can expect positive ongoing engagement during implementation, which is a very positive sign.

We also found useful examples of best practice within the organisation. Notably, the IT department has strong project and programme management practices, which could serve as a blueprint for further development in other areas of the organisation. Furthermore, all Stakeholders had a high opinion of the Project Management Office, agreeing that they were responsive and knowledgeable.

#### 4b. What requires improvement

We have categorised our findings by area, but also indicated how each of the findings connects to the issues identified in the initial brief and discussed in Section 2. This should indicate the systematic nature both of the issues themselves and of our proposed solution.

- 1. LOW THRESHOLDS
- 2. AN UNSUITABLE DEFINITION OF A 'PROJECT'
- 3. A FRAGMENTED PORTFOLIO
- 4. LACK OF CLARITY ON PROJECT ROLES AND RESPONSIBILITIES
- 5. ASSURANCE/RISK MANAGEMENT
- 6. BUDGET ALLOCATION AND DRAWDOWN
- Strategy and vision there are inadequate or inconsistent processes in place for project selection, prioritisation, and resource allocation. There is an overly broad definition of 'project' and no clear and consistent framework for ensuring that there is distinction between programmes and projects (2), and that these are systematically prioritised to deliver the greatest benefits against strategic objectives. (3, 5).
- Governance and oversight Governance responsibilities are disproportionately placed with Members rather than Officers. Insufficient delegation to Officers, coupled with a lack of clarity on project roles and responsibilities, has led to projects requiring additional oversight to compensate. This is a vicious cycle, which leaves Officers without the necessary powers, and Members without the necessary time, to do their respective jobs effectively.

However (as we shall explore later in 'Recommendations') such ongoing oversight as is required need not be provided by the Members themselves, but could instead sit with a Portfolio Board, whilst accountability for delivery of individual projects and programmes remains within Service Areas/ Directorates. Delegating decision making in this way would allow SRO's and PPMs to follow a more comprehensive framework, that supports all key activities associated with delivery. Meanwhile, relieving Members of the additional scrutiny of projects responsibility of

Page 601

project enabling them to take a more strategic perspective, and thereby strengthen the Corporations strategy and vision. (1, 2, 3, 4, 5, and 6).

 Management and capability - The Corporation requires a deeper understanding of best practices for project and programme management, and to develop capability and skills particularly in the latter. This lack of consistency in the way that projects are managed, as well as to limited or unclear processes for project and programme governance, risk and assurance and benefits management is further exacerbating the issues identified.

All Stakeholders agreed that the PMO were responsive and knowledgeable and would welcome a more proactive approach from them through all phases of the project lifecycle. However, both the Corporate PMO and MPPMO are currently wholly under-resourced to achieve this. It stands in need of investment in order to enable it to effectively support the whole organisation and provide the full breadth of a PMO service offering.

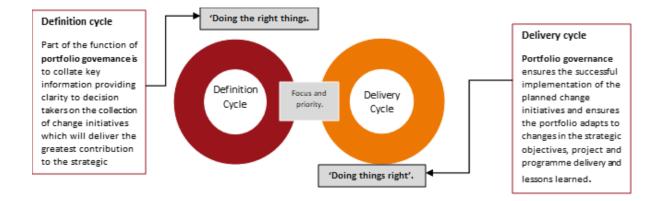
Part of the issue is the inappropriately broad definition of 'project', which has led (for example) to Members receiving project reports for the purchase of vehicles or pianos to replace existing assets. However, capacity within the PMO is limited not only by the volume of projects, but also by the scope of reporting, a lack of delegated powers, and a lack of clarity regarding the scope of some roles (1, 4). The PMO are currently unable to report on interdependencies between projects or to present an holistic view of projects across the current Portfolio. The impact of this is to limit the Corporation's capacity for an overall strategic vision.

Proper risk management requires a clear connection between project approval and finance approval. As things stand, there is a disconnect between the two, and notable variation between individual projects, with some going directly to the town clerk's office for approval, instead of following the routes articulated in the project's procedure (1, 3, 4).

The Corporation's capacity for risk management is also affected by the disproportionate amount of time spent on operational issues and approving reports for nominal sums, rather than more strategic issues and oversight of risks. The cause of this is the high number of reports submitted to the Committee, which is itself caused by the inappropriately broad definition of 'project'. The overall effect is to force under-developed business cases into funding assumptions too early.

There is a corresponding problem with establishing programmes of work. All activity is classified as a project, which means the Corporation is not making best use of industry standards that would support revenue/ transformation change programmes and the inherent processes which for example emphasise tracking benefits management. Assessing these benefits requires drawing out a clear connection between activities and intended outcomes which a project management approach does not emphasise. Stakeholders we interviewed agreed in general that tracking benefits and lessons learned is not routinely carried out beyond gateway 6, and often not within a project (should be a programme). Whilst capacity was cited as a barrier, most stakeholders were keen to be able to do this.

#### 5. Our proposed model



#### 5a. Summary overview of how it works.

At the core of our recommendations is the implementation of a Portfolio Management Framework, which consists of two portfolio management cycles: portfolio definition (structures and functions) and portfolio delivery (good governance for project and programme delivery). This Framework can be applied to the totality of the Corporations investment portfolio, capital, and revenue projects.

The implementation of this framework will break down silos in the organisation and promote a more integrated and streamlined project delivery process. It will also ensure that the portfolio aligns with organizational strategy and goals, and that interdependencies, benefits, and risks are identified and managed. The proposed approach also suggests organising work into sub-portfolios, which can help to ensure that BAU and cyclical work are not subjected to unnecessary ppm controls, thereby improving the efficiency and effectiveness of portfolio management overall.

It is important to note that a Portfolio Management Framework is more than the adoption of a new delivery standard. It is a total transformation that requires a change in culture, mindset, and processes across the organisation. Whilst the proposal to adopt a portfolio management framework is the right direction of travel for the organisation, it is essential to recognise the substantial gaps that need to be addressed before embarking on this journey fully.

This transformation needs to begin by establishing a set of consistent practices and processes, which are essential to successful portfolio management, and which are currently lacking in the Corporation.

We therefore recommend an incremental approach to building out the foundational elements of good portfolio management practice. This approach can help the organisation to address the gaps identified in the design phase of the review teams work and gradually implement best practices over time. The speed and efficacy of this process will depend on the organisation's resources, capacity, and change appetite. It is essential to have a clear understanding of these factors before embarking on the journey fully. Low change appetite within the organisation can be a challenge, but it's not insurmountable. It will be crucial to communicate the benefits of portfolio management and the need for change clearly to build support for the initiative and increase the organisation's change appetite over time.

There are two major forms of change being proposed for the current project's ecosystem.

- <u>Changes to supporting structures and functions:</u> The introduction of a Portfolio Board, Office, and EPMO (fully resourced), and clarification of roles and responsibilities across different stages of project delivery.
- <u>Procedural changes:</u> Changes to processes related to finance and risk management, definition, categorisation, tiering, reporting, roles and responsibilities, toolkits with standardised templates such as updated Business Cases based on industry best practice, systems, and a new gateway assurance process.

Making changes to the way that project and programmes finance is managed, in connection with the proposed changes in the Chamberlain's transformation process, will mean that risk tolerances will be set and agreed, and funding will be available for more detailed feasibility studies to improve the accuracy of business cases. See annex three for more details.

Both of these forms of change represent a substantial shift in the current operating model of the project ecosystem. The structural changes will result in more centralised oversight and coordination of projects within the portfolio, with greater emphasis on strategic alignment and ensuring quality. The procedural changes will result in more consistent and standardised processes for managing risk and assurance across all projects and programmes within the portfolio. This will be facilitated by the EPMO and the use of ppm methodologies as appropriate, in simple terms governance for projects v programmes, capital v revenue, appropriately scaled.

It will be important to carefully plan and communicate these changes to all stakeholders to ensure that they are properly understood and implemented. It will also be important to provide training and support to staff to upskill them in the new ppm processes and practices. Additionally, ongoing monitoring and adjustment will be necessary to ensure that the processes are effectively implemented and deliver the expected benefits.

To help implement and support these changes, we recommend that the Corporation look to develop a centralised portfolio management office. This centralised office will be in a position to provide oversight and coordination for the portfolio of work, and to develop clear definitions, processes and principles for program and project management, risk management and delivery management. The establishment of this office should be regarded as a medium to long term goal. In the short to medium term, we recommend that the Corporation lay the necessary foundations required in advance of setting up this new office.

Later in this report, we will provide step-by-step guidance for a programme of incremental improvements, each of which will have an immediate positive effect as well as cumulatively preparing the Corporation for the end goal of a centralised portfolio management office. Firstly, however, we will go through a fuller explanation of the portfolio management approach and offer an account of how this approach will benefit the Corporation.

**Note** that whilst the Portfolio Management Framework can make drastic improvements to the current project ecosystem, its success will rely on changes to the underlying operational changes for instance how BAU activity will be managed once de-coupled from the 'Portfolio ecosystem' as well as cultural and environmental. This work should be considered as a part of a broader transformation effort that addresses not only the current project ecosystem and BAU operational and approval processes but the organisation as a whole e.g., Members commission feasibility assessments/ business cases prior to confirming a project/programme decision on activity. This transformation will require leadership (Officers and Elected members) to come together provide a clear vision and engage employees in the change process to ensure a successful outcome.

#### Why - Portfolio management

Portfolio management enables organisations to review all work programmes as a whole, developing a deeper understanding not only of their individual functions but also their interdependencies. By understanding the causal interrelationships between different areas of the organisation, senior leaders are able to make far more informed and effective decisions regarding the prioritisation and sequencing of work. They are able to align their projects, programs and initiatives with their strategic objectives and goals by selecting, prioritising, and managing the right mix of projects and programs that deliver the most value.

Portfolio management relies on the implementation of a management framework, which defines how the portfolio should be directed and managed. A portfolio management framework consists of a coordinated collection of practices which, when applied together, enable the most effective balance of organisational change and business as usual, while remaining within a specific funding envelope.

The coordinated collection of practices includes:

- Agreed roles and responsibilities for portfolio management, enhancing understanding of who will make what decisions and when.
- Agreed overarching policies and practices regarding:
  - o Governance
  - o Risk management
  - o Assurance
- Agreed applied processes for:
  - Project selection,
  - Prioritisation,
  - Resource optimisation,
  - Performance measurement,
  - Regular portfolio reviews

We can think of this as the *who*, the *what*, and the *how*. Who is responsible for making the decision? What high-level organisational strategy and goals should inform that decision? How can we best ensure success? The ability to answer these questions is key to effective portfolio management.

# How this approach will benefit the City

As things stand, there is a fragmented approach to managing the portfolio of projects across the Corporation, with transformation or change activities excluded from procedural guidelines. Whilst our findings show there are structures in place which could support such activities, they are hampered by one or more of:

- 1. resource (Corporate PMO and MPPMO) capacity issues,
- 2. unclear definitions of ppm activity,
- 3. low thresholds,
- 4. lack of delegation,
- 5. lack of portfolio expertise to fulfil this type of function effectively.

This in turn is preventing the development of oversight of all projects within the City and hampering its ability to adequately track and scrutinise the weight or effort of resource apportionment against Corporation priorities.

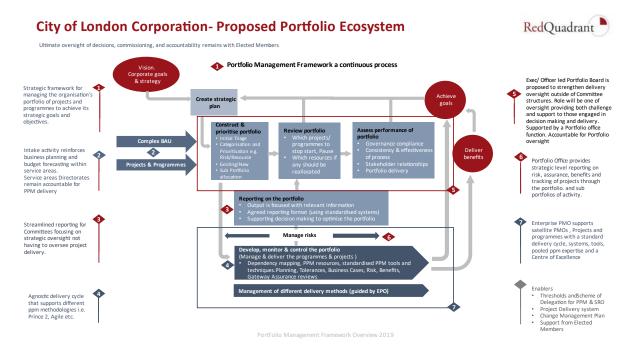
Implementing a Portfolio Ecosystem in the City will help to address the specific weaknesses in the current project governance structure, improving the City's ability to:

- 1. Deliver projects and programmes effectively and efficiently (e.g., delivering specified outputs to time and cost),
- 2. Deliver outcomes through projects and programmes, including 'hard' outcomes such as capabilities delivered through equipment or infrastructure as well as 'soft' outcomes delivered through changes in behaviours and cultures,
- 3. Align its change activities with its objectives,
- 4. Avoid over-committing to change, and thus risking failure both in the change process and in the delivery of Business as Usual (BAU).

#### 5b. Proposal and Recommendations - structure and processes needed to make it work.

#### **Portfolio Definition – Operating Model**

Our recommended operating framework consists of the following elements:



#### Also see annex Figure 1 and 2

The Portfolio operating model recognises and emphasises the important role of Elected members in providing ultimate oversight of decisions, commissioning, and accountability. By reducing their involvement in micromanagement of project delivery, Elected members can focus on setting strategic priorities, identifying new opportunities, and ensuring that the Corporation is moving in the right direction.

- 1. **Portfolio Ecosystem** Proposed operating framework provides a structure for aligning and prioritising projects, allocating resources, and monitoring progress and outcomes. It does not for example assign projects such as engineering/ infrastructure etc but seeks to centralise PMO activity whilst recognising the different delivery methodologies required.
- Intake activity reinforces business planning and budget forecasting within service areas. Cyclical/Routine BAU activity would <u>not be</u> managed through this process, although stakeholders have indicated that more complex BAU would benefit from additional project governance to support delivery.
- 3. **Streamlined reporting** for Committees focusing on strategic oversight. This implies that Programme board level delivery oversight is managed by Officers and not by Service Committees.

Reporting will need to be designed agreed with wider stakeholder involvement and standards of reporting templates agreed.

4. Enhanced project and programme delivery practices. Is describing an agnostic and enhanced delivery cycle (aligned to government functional standards for ppm delivery) it supports different ppm methodologies i.e., Prince 2, Agile and should be determined by the

nature of the programme or project. The Enterprise PMO should look to define what these methodologies will be.

- 5. **Portfolio Office** provides strategic level reporting on risk, assurance, benefits and tracking of projects through the portfolio. and sub portfolios of activity.
- 6. Officer led Portfolio Board is proposed to strengthen delivery oversight outside of Committee structures. Role will be one of oversight providing both challenge and support to those engaged in decision making and delivery. It will be responsible for managing Portfolio operations but accountability for delivery remains with individual departments or service areas.
- 7. Enterprise PMO supports satellite PMOs, Projects and programmes with a standard delivery cycle (new project and programme management processes), systems, tools, pooled ppm expertise and a Centre of Excellence

The models also require the **definition of sub-Portfolios of work**. There are a number of approaches, to achieve this but it will be down to the organisation to select the most appropriate one. Examples include alignment of sub-Portfolio to the top 5 strategic objectives, alternatively these sub-Portfolio could be aligned thematically. It helps to frame the definition of sub portfolios in terms of the management information requirements of the organisation.

By defining the sub-portfolios, it will **support project and programme selection and prioritisation**, and allow for clear and measurable objectives and ppm goals to be defined. This will ensure that the portfolio remains aligned with organisational strategy and goals and that resources are used efficiently. Regular review and performance measurement will help to identify areas for improvement and ensure the portfolio remains aligned with organisational strategy and goals over time (vis the Portfolio Office and Portfolio Board functions).

The project governance review was preceded by a process improvement project in the Chamberlain's service that also included recommendations for the management of financial risk; and the dependencies between the two activities. These have been incorporated into the proposed portfolio management operating model.



#### **Benefits and outcomes**

#### Proposed Benefits (to the operating framework as a whole)

- A clear structure for decision-making, communication, and reporting across the organisation, ensuring that all stakeholders are aware of the portfolio's objectives, progress, and performance.
- Clear processes around definition and categorisation, allowing BAU/Low value activity to be filtered out of the Portfolio and new projects and programmes processes at the initiation stage.
- Projects and programmes can be prioritised effectively.
- The opportunity to create a Portfolio Board, with clear terms of reference, and the authority to recommend stopping projects.
- Central oversight of the Portfolio pipeline enables clear visibility of strategic alignment, risk profile, resource management and dependencies.
- Streamlined, transparent, evidence-based decision-making.
- Merge funding and project /programme approvals allowing for faster turnaround time for decisions to be made and funding to be released.
- Improved information flows, allowing governance bodies to be proactive, and to make decisions to delay or desist actions, or to recommend interventions.
- Consistent, effective delivery of projects and programmes in line with Government Functional Standard

During implementation the activities within each stage will need to be refined, e.g., level of delegated authority and decision making that the proposed Corporate Portfolio Office structures are allowed. This may for instance include changes to the TORs of the OPP committee once reviewed against the proposed TORs of the Portfolio Board.

# **Key Changes Required**

The proposed changes to supporting structures and functions are as follows:

# Officer led Portfolio Board to be established, reporting to the Town Clerk.

We propose the creation of a Portfolio Board, supported by a Portfolio Office. This will strengthen delivery oversight outside of Committee structures. These central oversight functions will coordinate delivery, strategic reporting and monitoring, assurance, risk, and investment.

# The Portfolio Boards proposed remit:

- Their role will be one of oversight providing both challenge and support to those engaged in decision making and delivery.
- The Board will exert its influence through the gateway review processes, which overlay
  project and programme management practices, and which are aligned to
  portfolio management.
- The Board will have a mandate to recommend stop/ pause/ rejection of ppm activity.
- The Board will make recommendations on investment decisions.

- The Board will provide (through the Portfolio Office) an Initial project filter, implemented prior to member oversight, that ensures that only projects that are likely to be feasible are accepted.
- Capital funding to be ringfenced for general pre-feasibility and feasibility activities, and will sit with the portfolio board, enabling them to maintain central oversight and to support alignment to strategic objectives. The Board would make recommendations on new proposals after completion of these activities.

The **Portfolio Board** works in the space where corporate objectives and delivery processes meet. Its function is to maintain awareness and alignment. There currently exists a corporate level projects board, which has tried to undertake some of the functions described above. This could be requisitioned to form an early-stage Portfolio Board. However, Service Areas / Directorates will remain accountable for project or programmes delivery.

# Portfolio Office and Enterprise PMO (as the Hub to satellite PMO's in the Corporation and Institutions)

# Current

The Corporate PMO and MPPMO are made up of two full time staff each, who are not in a position to provide the full range of services normally associated with a PMO. Additionally, there are a number of additional PMOs that operate across the Corporation acting independently of each other.

We propose the establishment of a common approach to portfolio management via a centralised portfolio management office which will consist of the office supporting the Portfolio Board and the enterprise level PMO.

**The Portfolio Office** will help the Portfolio Board make decisions by providing it with an accurate and detailed view of progress against the strategic objectives. It will administer the Portfolio Board processes, and coordinates activity with other Boards.

# This function does not exist and would require investment.

**Enterprise level PMO (EPO):** As part of this Portfolio Office structure, there would be a central EPO function. This function will manage the front-end delivery cycle, which projects and programmes will follow.

• This enterprise level PMO will function as the Centre for all other PMOs within the organisation, encompassing both the Corporate and the Major Programmes PMOs. As part of implementation, it is recommended that an assessment is made to determine the number and specific function of all the PMOs that exist within the Corporation, with a view to merging these under the Enterprise Level Office. Institution PMOs are excluded from and suggestion of a merger in implementation. They would instead function as spokes to the main Hub EPO. (There may be value in undertaking a cost/benefit analysis of this in the future).

- The EPMO will set the standards for ppm delivery, provide tools, templates, and guidance, and administer alignment to the new project and programme management delivery standards, through the articulation of a service catalogue.
- Within this structure there will be a pool (permanent / temporary) of delivery experts. Their initial function will be to build the Portfolio management framework, but in the longer term, the EMPO will be comprised of an internal staff of delivery experts.
- This office would also house a Centre of Excellence Function, focussed on improving the City's in house ppm capability and capacity, and managing the evolution of the inhouse Project Academy/ or other training and development functions in coordination with Learning and Development functions within the Corporation.

<u>This function does not exist and would require investment.</u> Currently only one individual remains in the Corporate PMO, and this is insufficient to meet the Corporation's ongoing needs. There is also an Interim Head of Strategy/PMO to manage the development of this function.

# Portfolio Delivery - enhanced projects and programmes processes

#### Current

Based on our analysis, the current project procedure has several limitations and weaknesses and does not meet the needs of all stakeholders involved in the <u>project and programme delivery process</u>. As previously indicated from stakeholder feedback it is felt that the current process/gateways add unnecessary governance for what should be routine BAU activity. The procedures focus is on construction projects, and the restriction to capital projects between £50k-£100m, creates limitations for other types of projects and creates inconsistencies across the Corporation. Some but not all of these issues are contributing to inconsistent project practices across the Corporation. It should be noted that there are some areas within the Corporation that have strong ppm standards, but feedback suggests that by and large the lack of clarity around the project's procedures, in terms of gateways, as well as the number of committee approvals required, ultimately detracts from the efforts of 'getting on with the job'.

The current projects procedure also has significant issues with the Gateway process. The lack of clear governance roles, and the absence of an assurance process, are causing excessive scrutiny of low value/BAU activity. This leads to an onerous and cumbersome process for those involved. The Gateway documentation is not proportionate, which results in key documents being submitted on non-standard templates, which is aggravating the difficulties with the process. There is also confusion about who is responsible for supporting the Gateway process and maintaining standards, which is further complicating the situation.

# Proposed

We propose that the Corporation adopt a more up to date holistic ppm delivery framework, that is agnostic of methodology, and fit for providing appropriate and proportionate governance across projects and programmes. It should be flexible, risk-aware, and stakeholder-focused, and should provide clear and effective communication channels. It should also provide a standardised framework for ALL projects and programmes, and set out a consistent, repeatable process for delivery.

# Recommendations

- Separating BAU activity from the new Portfolio Ecosystem and adopting standards of project and programme management aligned to industry standards will support the Corporation in addressing key issues with the current project procedure and Gateway process. Alongside the other recommendations (see Chamberlains Transformation review) This will help streamline the ppm delivery processes overall.
- The enhanced ppm process would apply to ALL projects and programmes across the Corporation, as part of the new Portfolio Ecosystem. It would ensure that Officers are empowered to effectively manage the projects they are responsible for, and to take prompt decisions to manage operational risks. It will also ensure that they are enabled by corporate systems and financial processes, as the Corporation develops a more streamlined, joined-up process focussed on the needs of Project and Programme delivery teams.
- The proposed changes should also help to increase the visibility of strategic alignment, risk profile, resource management, dependencies, finance, benefits, and consistent quality of delivery. By aligning with government functional standards for ppm delivery, which themselves align with a Portfolio Management framework, the Corporation could ensure that it is following best practices in the field and achieving the highest standards of project and programme delivery.
- In conjunction with the Portfolio office, the enhanced projects and programmes process will facilitate regular aligned ppm reporting into corporate boards on the current status of initiatives, risks, issues, dependencies, progress against key targets, deliverables, and benefits. Details of further enhancements can be found at Annex 7.

# **Proposed Benefits/ Outcomes:**

- The new process would apply to ALL projects and programmes across the Corporation, ensuring increased visibility of strategic alignment, risk profile, resource management, dependencies, and finance, as well as putting more effective controls in place to ensure quality of delivery.
- The Corporation would have an up to date and industry best practice approach to delivery.
- The Corporation would build core competencies within project and programme management teams and provide opportunities for career development.
- Project closeout would be better facilitated. There would be a clear handover to the business receiving the change, a consistent financial closeout process, and lessons learnt.
- A clearer project definition, along with an initial project filter developed prior to member oversight, will ensure that only projects that are likely to be feasible are accepted.
- Project and Finance approval would be brought together (see Chamberlains Transformation Recommendations) and through the new Business Case process.
- An improved and integrated assurance process based on the 3 lines of defence model including adopting a new Gateway process as defined in annex 3. (These assurance enhancements through a revised gateway process can also incorporate additional checks against other Corporate ambitions such as the Net Zero Strategy).

#### Key changes required.

Listed below and described in more detail in section seven.

Recognising that BAU activity is no longer part of the Portfolio ecosystem and subject to new project and programme management processes (exception being complex BAU to be agreed as part of implementation activity). There are two major changes being proposed for the current project's Ecosystem:

Firstly - The introduction of a Portfolio Board, Office, and EPMO, with clarification of roles and responsibilities across different stages of project and programme delivery. Alongside the financial recommendations aligned with the Chamberlains Transformation project this would bring in new delegations and approval routes,

Furthermore, making changes to the way that project and programme finance is managed, in connection with the proposed changes in the Chamberlain's transformation process, will mean that risk tolerances will be set and agreed, and funding will be available for more detailed feasibility studies to improve the accuracy of business cases, and long-term ppm budget and finance reporting.

Secondly - Changes to processes related to finance and risk management, definition, categorisation, tiering, reporting, roles and responsibilities, toolkits with standardised templates such as updated Business Cases based on industry best practice, systems, and a new gateway assurance process.

Both of these changes represent a substantial shift in the current operating model of the project ecosystem. The first change will result in more centralised oversight and coordination of projects and programmes within the portfolio, with greater emphasis on strategic alignment and ensuring quality. The second change will result in more consistent and standardised processes for managing risk and assurance across all projects and programmes within the portfolio. This will be facilitated by the EPMO and the use of ppm methodologies as appropriate, in simple terms governance for projects v programmes, capital v revenue, High risk vs low risk, appropriately scaled.

It will be important to carefully plan and communicate these changes to all stakeholders to ensure that they are properly understood and implemented. It will also be important to provide training and guidance to staff to upskill them in the new processes and procedures. Additionally, ongoing monitoring and adjustment will be necessary to ensure that the new practices are effectively implemented and deliver the expected benefits.

Overall, these changes represent a significant transformation in the current project ecosystem and will require a thoughtful and deliberate approach to implementation. With the right planning, communication, and support, the Corporation could ensure that it is following best practices in the field and achieving the highest standards of project and programme delivery.

#### 5c. Benefits of the structure and how it mitigates problem statements.

The ultimate benefit is to support the aim of the corporate plan: 'to strengthen the character capacity and connections of the city, London and the UK for the benefit of people who live, learn, work and visit here'. Implementing the suggested framework will ensure the City Corporation is justifiably confident that their projects and programmes represent best value and deliver the intended benefits for stakeholders.

The goal of Portfolio Management is to align the Corporation's resources and initiatives, enabling it to achieve its strategic goals. It involves the continuous evaluation and optimisation of the portfolio of projects, balancing investment, and risk across the Portfolio. Programmes and projects to deliver the desired outcomes, ensure effective use of resources and manage risk.

The implementation of a Portfolio Ecosystem, as proposed, would provide the necessary framework and support to manage the portfolio effectively. This will help ensure that the sum of the parts of the Corporation's portfolio of work delivers the desired outcomes, and allow for adaptation if priorities, desired outcomes, available resources, or delivery context change. It would also make it possible to compare individual projects and see them as part of a bigger picture.

The Portfolio Ecosystem will empower officers to effectively manage the projects they are responsible for. They will have the necessary autonomy to take prompt decisions and manage operational risks, whilst being properly supported by corporate systems and financial processes.

It will therefore ensure that Members are able to focus on strategic issues and areas of high risk and/or value, confident in the knowledge that lower risk/value projects are well managed, and that an effective assurance framework exists to identify any potential issues or risks.

Our recommendations clarify the role of the Portfolio ecosystem, including the proposed Enterprise PMO, and its function in maintaining project and programme management standards across the organisation. We have also recommended further investment in this function, improving its capacity to fulfil this role effectively.

Our recommendations would also ensure that delivery activities have an enhanced overall impact. The Portfolio process, combined with stronger programme management, will 'join up' projects and programmed into coherent groupings. The greater visibility of these connections will facilitate the realisation of 'soft' outcomes, which would be delivered through changes in behaviours and cultures.

#### Overall, the proposed portfolio management operating model will offer:

**Consistency:** By standardising the project and programme delivery approach, the operating model can help ensure that projects are delivered consistently, regardless of the project team or project type. This consistency can lead to improved efficiency and reduced costs over time.

**Clarity:** This clarity can lead to improved alignment between project goals and strategic objectives, which can ultimately lead to better value for money.

**Flexibility:** A proposed delivery cycle that is designed to be flexible and can adapt to changing project requirements or organisational priorities. This can help the Corporation respond more effectively to shifting market conditions or emerging opportunities, which can improve the overall value delivered by the portfolio.

**Continuous improvement:** Through a centre of excellence that continually refine the operating model, the Corporation can ensure that it continues to deliver value over time. This can include identifying areas for improvement, implementing best practices, and incorporating feedback from stakeholders.

In summary, the proposed portfolio delivery operating model can represent value for money if it is designed to align with the Corporations strategic objectives and is regularly assessed and refined to ensure that it continues to meet the needs of the Corporation and its stakeholders.

#### 6. Implementation plan

#### 6a. What you need to do

In recognition of the Corporation's starting point, implementation will need to be incremental starting with a focus on the foundations of good programme and project management. The speed and approach will need to acknowledge the appetite for change and the available capacity to deliver change. This needs to manage the risk of over-committing to change and adequately account for the need to maintain business as usual and ensure the delivery of corporate priorities.

Detailed bespoke blueprints to support key implementation activities have been developed and define the way in which the Portfolio Definition functions work in conjunction with Portfolio Delivery processes. Included within this are guidance and examples of the roles, responsibilities, processes, and tools necessary for successful implementation.

To successfully implement the recommendations, there needs to be a focus on wider enablers, beyond the direct implementation of the Portfolio Management Framework.

- It is critical that operational management arrangements (including business planning and budget forecasting) are strengthened, and clear governance and approval arrangements are put in place for business as usual and cyclical activities. This will release committee capacity to focus on strategic priorities by increasing trust. This is a major task but needs to go hand in hand with the implementation of the Portfolio management framework to ensure benefits are realised.
- Executive leaders will need to take more ownership and accountability for central oversight. For their part, Elected Members will need to sign up to and fully support the delegation of authority to executive leaders. The eventual goal of this should be the establishment of a portfolio board staffed by executive leaders, who will relieve the Members of some of their current project governance responsibilities.
- The implementation will be most successful if there is sufficient investment in resources to support the change process. It is recommended that a transformation programme team, bringing experience of delivering change in a complex organisation, is established to lead and manage the change process. It is acknowledged that some progress has already been made towards building this team.
- Investment is also vital to sustain the benefits of implementation. Immediate priorities include strengthening of the project management office to support its transformation to an Enterprise PMO, provision of targeted training across the organisation to build and embed capability and standardisation of ppm systems and processes to create strong foundations.
- Additional levers that sit outside of this review, related to financial thresholds and a Scheme of Delegation, via the Chamberlains Transformation project will play a key role in shaping the success of the Portfolio Ecosystem.

#### 6b. Order to do it in

#### Phased Implementation of a Portfolio Management approach

It is recognised that adopting a Portfolio Management framework is a long-term ambition and will need to happen in phases, at a pace which matches the Corporation's appetite for change and capacity for managing the transition. The initial step will involve getting sign off and buy in to the recommendations and proposed operating model defined in this report. The next step will be refining these into workplans/ workstreams to build out the implementation plans (depending on what mix of recommendations is finally agreed upon).

Pre-implementation or 'Discovery' phase activities will include an assessment of readiness for initiating Implementation:

**Resources** – Investment decision needed on the resources required to support immediate implementation activity. Proposed:

- Interim AD of Portfolio to be responsible for the overarching Portfolio Ecosystem Transformation Programme
- Interim Head of Strategy / EPMO In post
- Head of Transformation Change Management x2 In post
- Short term programme planner to build and capture this Transformation programme activity, milestones, and dependencies with other transformation activity.
- Expert level Programme Management resources x 3 to support with building out Portfolio Strategies, Tools, and templates, and supporting new projects and programmes to get off the ground using the new processes. Can support as ppm lead workstreams.
- PPM analyst support x2 to support with data collection and analysis.

#### Portfolio Definition (operating model)

The highest priority in terms of Portfolio Definition would be to work with senior stakeholders such as the Town Clerk and Elected Members, to set out the overall vision and strategy for the Portfolio, ensuring alignment with Corporate Priorities, and clarity for Delivery teams.

#### **Portfolio Delivery**

- **Centralised Database for ppm data and reporting** Standardised Project Management System, This requires an immediate decision post Project Governance Review completion. Given the associated timeframes with design of the system, training, rollout and embedding the use of this system across all ppm activity this requires an immediate start.
- Definitions, Categorisation, Tiering and Prioritisation Agree on the proposed definitions for Complex BAU (to be managed as a project/programme), Projects and Programmes and the proposal for categorisation and tiering of projects and programmes. Once agreed commission this activity for an initial picture of the Portfolio pipeline.
- Work with the Chamberlains department Inform activity such as developing standardised templates which capture finance data requirements both for project and programmes and financial forecasting and aligning the schedule of finance monitoring and forecasting with the Portfolio Delivery cycle. Additionally, to introducing standardised business case templates and defining the processes to be followed.

- Scope requirements and Draft Job Descriptions for Portfolio support functions In order to arrive at Initial Operating Capacity (IoC) there will need to be a minimum level of staff in the Portfolio Office and EPMO. It is therefore essential to get the recruitment process underway.
- Development of Portfolio Strategies i.e., Risk and Benefits management, supported by standardised documentation and Tooling Several strategies will need to be defined at Portfolio level, for example Risk Management. The development of these strategies can begin immediately; once signed off, the implementation team can then begin building a toolkit of standardised templates, guidance, and documentation to support project and programme delivery. They can also inform the design of the ppm system in terms of reporting.
- **Change Management strategy and plan** The activity and support that will run throughout the implementation to help embed the changes within the Corporation.
- Skills and Capability Work with L&D and HR colleagues to broaden the skills and capability survey or conduct a separate training needs analysis (TNA) to build a holistic picture across the organisation. This can be used to inform training and development requirements and align with implementation activities to ensure that staff are suitably skilled and prepared to adopt the new ways of working.

### 7. Annex

Supplementary guidance and tools to support this section can be found in the Blueprint Appendix

#### 1. Proposed - Roles and Responsibilities.

#### Proposal for clear roles and Responsibilities inc. SRO / Sponsor and project/ Programme Boards

The review team held workshops and 1-1 discussions and explored a range of documents including project and programme board terms of reference (ToR), job descriptions (JDs) for project roles, and the project procedure document, to provide a better understanding of how the current project governance structure is operating, and where there may be inconsistencies or gaps.

The review team found that there appears to be an inconsistent approach to defining roles and responsibilities across the City's project governance process and that this appears to contribute to confusion among stakeholders about who is responsible for what. Potentially impacting on project outcomes.

Additionally, the interviews suggested that project managers fulfil multiple roles in addition to their primary role as a project manager. This can and does, lead to capacity issues and ineffective delivery of some responsibilities. A specific example is benefits tracking post project close which is not routinely carried out. This is a critical activity which ensures benefits are realised over the longer term with projects delivering the full value intended.

The review work also found that project and programme board Terms of Reference pointed to a variation in quality and definition. There are good areas of practice such as the Major programmes board whose approach was consistent and well defined although very administrative heavy.

SRO role descriptions were not apparent. However, it is acknowledged that a role specification has been created for SROs in recent weeks. Current lack of clarity on this means that those agreeing to be SRO's underestimate the capacity, obligations and knowledge required to undertake the role effectively.

#### Proposed

To address these issues, it will be important to establish clear and consistent definitions of roles and responsibilities across the portfolio governance lifecycle. See Blueprint appendix.

#### Recommendations

It is recommended that you define clear roles and responsibilities at project definition stage and adopt standard roles and responsibilities as part of the enhanced projects and programmes process. This will be supported in part by the EPMO who will provide standards for good governance. This will give a better distinction between the roles of a project manager, programme manager, benefits manager, business change functions, risk management, finance Business Partner and SROs.

It is also recommended that this includes responsibilities, and accountabilities for each project and programme, and those of project boards and that the role of service committees are captured at the start. In addition, this should include clearly defined delegated authority given by the new scheme oof delegation This will enable accountability of responsibilities, facilitate decision making and reduce delays.

It may also be necessary to reassess the workload of project managers to ensure that they are not being overburdened. Additional resources may be needed to fulfil roles in the new ppm governance standards and ensure that responsibilities and roles are effectively carried out.

#### **Benefits / Outcomes**

- ✓ Empowerment through clearer definition of roles and responsibilities
- ✓ Through the proposed initial filter/ triage of projects also assess the availability and level of PM resource and other key roles required for successful delivery, to avoid overburdening individuals.

#### **Changes Required**

- ✓ Through the establishment of the Portfolio office structures, the EPMO can establish good guidelines for project and programme governance and roles and responsibilities.
- ✓ Looking to the future ensure career defining pathways are adopted in conjunction with HR/ L&D.

#### 2. Proposed - Governance, Assurance and Risk Management

An effective and proportionate Governance, Assurance and Risk Management approach for PPM establishing key lines of defence and an effective and proportionate Risk management processes across the Portfolio ecosystem.

The requirement was to propose an effective and proportionate project Governance, Assurance and Risk Management approach for PPM establishing key lines of defence and an effective and proportionate Risk management processes across the proposed Portfolio ecosystem.

We worked closely with key stakeholders in Corporate Risk and Strategy, Audit and Finance to review the current policies and strategies around Assurance and Risk, how these interact with the current Gateway process and projects procedure and validated the issues that were raised in the project brief. Next, we worked with stakeholders such as the Head of Audit and Corporate Risk Lead as well as the Head of Corporate Strategy to develop a proposal for a more effective approach to Portfolio Governance, Assurance and Risk Management, based on best practice in similar local government organisations as well as industry best practice i.e., Government Functional Standard for Portfolio, Programme, and project delivery.

#### Governance

The oversight and ownership of individual projects and programmes currently sits with SROs, and Project Boards, however SROs are not empowered to deliver against these governance requirements. The Corporation relies heavily on Members and committees (rather than officers) to carry out such functions as project oversight, risk management, and assurance functions; the OPP Sub Committee Terms of Reference state that Members are responsible for authorising individual projects and overseeing the Corporation's 'programme of projects to ensure their delivery within the parameters set by the Resource Allocation Sub-Committee'. A common thread fed back from all stakeholders is the view that there is excessive direct involvement of committees and Members in the project procedure/gateway, and Members feel overwhelmed by heavy Committee agendas and meetings in which a disproportionate amount of time is spent on the detail of low value/BAU activity which is drawn into the gateway process drawing focus away from strategic decisionmaking. The Corporate Projects Board reviews projects and programmes but does not provide any triage, definition or categorisation which would more effectively determine proportionate Governance arrangements. There also seems to be a lack of clarity around the approach to stopping poorly performing projects; feedback from stakeholders indicates that this rarely happens.

#### **Proposals:**

Through the Portfolio Ecosystem and coordinating functions specifically the EPO introduce more robust standards for establishing good governance arrangements for ppm activity.

#### **Recommendations:**

To create a Portfolio Board with the proposed remit as follows:

- Role will be one of oversight providing both challenge and support to those engaged in decision making and delivery.
- Exert its influence through the gateway review processes which overlay project and programme management practices aligned to portfolio management.
- Have a mandate and recommend stop/ pause/ rejection of projects.
- Make recommendations on investment decisions.
- Initial project filter be developed prior to member oversight that ensures that only projects that are likely to be feasible are accepted
- Capital funding ringfenced for general pre-feasibility and feasibility activities and sits with the portfolio board to maintain central oversight and support alignment to strategic objectives. Board would make recommendations on new proposals.
- Update the TORs of the OPP committee to reflect these changes.

#### **Outcomes/Benefits**

- Moving more of the Governance into the Officer space enables elected Members focus on strategic decision-making and areas of high risk and/or value whilst giving assurance that lower risk/value projects are well managed.
- Streamlined reporting and recommendations underpinned by Governance and Assurance that is evidence-based, informed by understanding of risk and focused on quality of delivery
- Effective check and challenge through the coordinating Portfolio functions and Portfolio Board

#### **Changes required:**

- Work with Members to revise the Terms of Reference for the OPP Sub-Committee
- Work with stakeholders in Audit and Risk Management to develop Terms of Reference for the Portfolio Board
- Develop a clear, standardised methodology for assessment and prioritisation of activity, balancing investment, and risk across the Portfolio.

#### **Assurance**

From our findings there is evidence of good practice across some project areas, but Assurance is focussed on Capital projects – i.e., projects delivering tangible assets from £50k to £100m in value, which is only a subset of all project and programme activity. Revenue-based projects such as transformation and Digital are completely excluded and there seems to be a degree of variability in the way that existing processes are applied, tracked, and reported. Governance structures are in place but effectiveness in providing proportionate scrutiny or check and challenge and balancing this against requirements to deliver projects efficiently can vary.

The result of this is that Members spend a disproportionate amount of time in sub-committees scrutinising low-risk, low value projects because the assurance is not built into the process.

Many successful organisations in the public and private sector adopt a three/four 'lines of defence' assurance model. The HM Treasury, Audit and Risk Assurance Handbook, draws attention to the support required for Accounting Officers and Boards, who have multiple issues competing for their attention. Assurance draws attention to the aspects of risk management, governance and control that are functioning effectively and, just as importantly, the aspects which need to be given attention to improve them. A well-designed assurance framework helps.

#### **Proposals:**

Implement Corporation-wide, integrated assurance processes for all programmes and projects within the new Portfolio Ecosystem, based on Government Functional Standard for ppm delivery. The proposed also includes updating the Gateway Assurance framework based on checkpoints, standardised documentation and evidence, and Assurance Reviews carried out throughout the process on high priority projects by centralised oversight functions with knowledge and expertise in key areas such as Risk management, Planning and resources, Benefits management, and Finance.

#### **Recommendations:**

To create a Portfolio Office and EPMO to support the Portfolio Board, carry out 1st and 2nd line assurance activities and support Project and Programme Managers with guidance and tools to manage delivery more effectively.

It is recommended to adopt a 'three lines of defence' model of assurance which would work as follows:

**1st line Assurance** – The PMO carries out 1st line assurance, amongst other responsibilities, and ensures that ppm management and delivery is consistent. All staff are responsible for delivering in line with these standards. In itself assurance does not deliver a project or programme, but it can identify and help mitigate any risks to successful delivery.

**2nd line Assurance** - The Portfolio Office sets standardised project, programme and portfolio tools, processes, and guidance in place for all staff to support delivery. They are responsible for 2nd line assurance (including Gateway reviews) providing independent assessment and ensuring 1st line arrangements are in place and operating as intended.

#### **3rd line Assurance** – carried out by internal Audit.

It is also recommended to adopt systematic Assurance Reviews at Gateways/Checkpoints based on a methodology outlined in Government Functional Standard for ppm delivery, with an objective, evidence based scoring framework, enabling reporting with stop/go recommendations to decision-making bodies.

#### Benefits/Outcomes:

- Risk and assurance elements are integrated within the Portfolio Ecosystem and would give Members confidence that project and programmes represent best value and deliver the intended benefits.
- Project governance will be risk-based, moving more into the Officer space under the new Portfolio Board. This will allow Members to focus on strategic issues and areas of high risk and/or value whilst gaining assurance that lower risk/value projects are well managed.
- An effective assurance framework based on the 3 lines of defence model will identify any potential issues or risks and give scope for early intervention at checkpoints which are tailored to the needs of the Corporation.

#### **Changes required:**

- Work with Audit/ Risk to co-produce the new processes and ensure alignment with corporate standards for Assurance and Risk management, on the basis of the 3 lines of defense model (see Blueprint Appendix).
- Implement the new standards for Gateway reviews which integrate Assurance and Risk management processes. These would be overseen by the new Portfolio Bord and allow Members to focus on strategic decision-making.
- Portfolio office functions will also need to define the process / level of scrutiny that will be required depending on the categorisation/ Tier rating for the various levels of Programmes/ projects. This is key to developing proportionate Governance and Assurance pathways, enabling smaller fewer complex projects to progress without unnecessary delays and ensuring that Governance and Assurance of more complex high-risk projects and Programmes adds value for the Delivery team.
- Staff and key stakeholders across the corporation will require awareness training to familiarise them with the new projects process.
- Additional resources and or co-opting internal staff will need training on how to conduct checkpoint assurance reviews.
- Requirement to develop and define the Assurance and Checkpoint criteria based on best practice frameworks/methodology (Government Functional Standards) and develop associated guidance.
- Requirement on having a suitable IT system that can automate logging of assurance/ checkpoint reviews and RAID items.

#### **Risk Management**

Portfolio risk management is a structured assessment and analysis process. The goal is to mitigate activities, events, and circumstances that will have a negative impact on a Portfolio, and to capitalise on potential opportunities.

Additionally in portfolios, there are usually a large number of interdependencies and competing priorities. Portfolio risk management is crucial, because of the significant impact a component failure will have. In some instances, one component risk can potentially increase the risk of another, underlining its importance. Balancing these risks would be a core function of the Portfolio Board.

Risk Management is currently carried out a basic level for projects within the Gateway process; Guidance for Officers on how to progress between the Gateways together with the necessary documentation and processes to follow is provided in the Project Toolkit maintained by the Town Clerk's Programme Office and published on the Corporate intranet.

Project Managers are expected to record and report on their project status during the project's lifetime. The 'project status' is expressed in its simplest form as a RAG status (aka Red, Amber, Green).

There are areas of good practice, however our review work has identified challenges and gaps in the risk management approach within the project ecosystem. Examples identified to us include poorly managed project risk registers, no detail of mitigations or targets dates etc. indicating that the elementary requirements of risk management tracking and managing are not being adequately addressed. It should be noted that there are exceptions across the organisation. From our findings it is also concerning that projects have been approved without recognising these potential risks and their impact on project delivery.

'Costed risk' is used in project budget process, however this is often inaccurate and becomes a barrier to effective delivery.

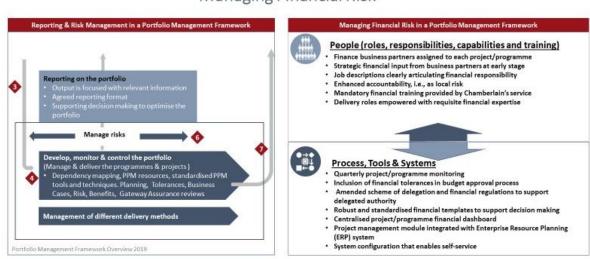
The lack of capacity for the Corporate PMO to support risk management is a recognised issue and should be addressed by ensuring that appropriate resources and support are available to support risk management efforts.

Finally, the lack of consistent approach to managing risk across projects that fall outside of the current Gateway process is a major concern. It is unclear what the Risk Management arrangements are for all other projects and programmes across the Corporation.

# Further issues have been identified through the Chamberlain's Transformation review which relate to project and programme risk management, for example:

- The existing project brief and project proposal requirements are not sufficiently robust to adequately support decision making. Consequently, projects that would not otherwise be considered feasible are progressed further down the gateway process than project fundamentals would dictate.
- Feasibility Funding Amendment Stakeholders have indicated that limited access to prefeasibility or feasibility funding contributes significantly to the quality of project briefing and proposal documents they are able to produce
- Stakeholders have indicated that the current Corporate Projects Board (CPB) is ineffective in its role of initial project oversight due predominantly to its composition and the quality of proposals it receives.

The project governance review of the Corporations Project Ecosystem was preceded by a process improvement project in the Chamberlain's service that included recommendations for the management of financial risk; these have been incorporated into the proposed portfolio management framework. See below.



#### Governance Review Managing Financial Risk

#### Proposals

• We are proposing a more defined and standardised processes to strengthen current Governance arrangements, (Portfolio Board/ links to Committees) and Assurance and Risk management procedures.

#### Recommendations

- The proposed new Risk Management arrangements would be overseen by centralised support functions, i.e., the Portfolio Office and EPMO and supported by standardised documentation and methodology – for example the establishment of risk tolerance and appetite at project and programme level, to replace the 'costed risk' approach.
- Risk would form a key strand of the centralised data and insight reported in by projects and programmes, enabling the Portfolio Board to maintain a live overview of the risk profile across the Portfolio.
- Through a central database of projects and programmes which will contain all related risk and assurance data and reporting, managed by Portfolio oversight functions (Portfolio Office and EPMO). This would link to the PPM data held by the other PMOs and allow each to support the other, make validation easier and provide the portfolio board with a holistic view.
- The Portfolio Board will have oversight of the risk profile across the portfolio and will mandate intervention where necessary, for example recommending that projects are stopped where risks are not being controlled.
- Project tolerances clearly defined at the outset of the project.
- **Risk and assurance will always be considered at 'gateways',** existing processes don't mandate formal review and considering it along with other PPM data should result in more effective gateways and controls.

The aim is to develop the skills needed at Service and Directorate level to allow them to be 'self-checking'. This is the same as the PPM model and the aim is that the central risk and assurance is there to check and validate what Services and Directorates have done and not to manage these risks or provide first line

assurance – the centralised Portfolio functions will operate as second line assurance, with Audit operating as third line in the 3 lines of defence model.

#### Outcomes/Benefits:

- Strategic reporting which provides clear oversight of the type and where the greatest risk is held in the organisation.
- Transparent evidence-based recommendations for decision-making, approvals and funding which can be taken with a high degree of confidence.
- Integrated assurance though the Portfolio Ecosystem and good ppm governance standards
- Assurance and governance controls established at the start of the project or programme. Assurance reviews for closure would require a standardised Benefits plan, financial statement and tracker, as well as a transition plan to BAU.
- Assurance reviews will inform recommendations around finance and risk.
- Robust checkpoint process ensures that project and programme delivery is consistently high quality and cost effective across the Corporation.

#### Changes required:

- Standardised and consistent practice through the introduction of new Portfolio definition and delivery structures
- Introduction of Risk Tolerances into projects and programmes
- Risk and Assurance strategies defined in conjunction with corporate requirements.
- Templates, and tools facilitated and mandated through the new EPMO function.
- IT system that supports central logging and reporting on Risk, assurance
- A new Gateway review procedure that integrates the necessary checks and balance throughout the delivery lifecycle of projects and programmes
- Training to support staff in understanding their responsibilities (duties) to support the organisation manage and mitigate risks as well and learning to understand and apply the new processes.

#### 3. Proposed - Definition and Categorisation

Deliverable for clear PPM Definition and Categorisation including an innovative approach to project thresholds and criteria considering value/risk based on best practice project management in similar public organisations as well as Tiering to facilitate future prioritisation of the Portfolio.

The review team worked with the CoL PMO team to map existing processes across Corporate and Major Projects and PMO and carried out a series of initial stakeholder interviews and workshops to check and validate the issues raised in the Project Brief. Next, we identified and engaged with stakeholders across the Corporation, including the Head of Audit and Assistance Director of Finance and worked in parallel with Chamberlain's Transformation programme lead to develop a tailored approach. Draft outputs were tested at weekly team meetings.

Our findings showed that currently there are no standard corporate definitions of what a project/programme is. The only determinant of what activity is drawn into the Gateway process is a financial threshold of £50k, which is very low and means that most if not all activity is drawn in. The challenges this leads to are:

- A fragmented Portfolio containing too many (350) projects with too much time spent on low risk items.
- Operational/BAU activity drawn into the Gateway process.
- Inefficient and bureaucratic process
- Nonalignment with industry standards
- Costed risk is difficult to assess accurately and limits the ability to respond in an agile, flexible way to project delivery challenges.

There is also a variation in the use of templates and documentation. The Gateway process has an existing set of standardised documentation, there is also an existing project management toolkit which is available on the Town Clerk's site. Although there are examples of good practice in developing business cases and initial project documentation, the feedback from project delivery staff is that it is not always clear which templates to use and they will often develop and use their own, which leads to inconsistent quality and standards.

Additionally, there are a number of interconnected issues with finance and project delivery, which are highlighted in the Chamberlain's Transformation Review:

- Currently, all capital spends larger than £50K and smaller than £100m is defined as a capital project and subjected to the onerous gateway process.
- The existing project brief and project proposal requirements are not sufficiently robust to adequately support decision making. Consequently, projects that would not otherwise be considered feasible are progressed further down the gateway process than project fundamentals would dictate

#### Proposals:

To mitigate these challenges and enable Portfolio management and effective focus on the right activity within the portfolio of work it is essential to consider:

- Adopting a set of clear definitions of what project/programme activity should be included in the Portfolio vs BAU activity which should be managed and monitored operationally by the business.
- Adopting a new scheme of financial delegation to better facilitate project budgeting and forecasting
- Adopting a standardised methodology for categorising and tiering projects and programmes to allow de facto prioritisation of the Portfolio and sub portfolios once established.
- Adopting a standardised documentation and templates for Opportunity Framing, Project Initiation and Business Cases

**Recommendations:** 

*In parallel with the recommendations from the Chamberlain's transformation review:* 

- It is recommended that the project definition be amended to ensure that only complex transactions requiring project management skills and oversight are defined as projects. A project definition and categorisation tool has been suggested. It would need to be refined as part of implementation, along with a risk/complexity and value scoring matrix to help determine the Tiering of projects and programmes.
- It is recommended that an amended initial project filter be developed prior to member oversight that ensures that only projects that are likely to be feasible and best achieve stated outcomes are subjected to the full governance process. The Portfolio Office / EPO would undertake this.
- Feasibility Funding -. It is recommended that a portion of the capital funding available to the City be ringfenced for general pre-feasibility and feasibility activities and allocated to service departments on an objective basis. This would be delegated to the Portfolio Office function to provide that central oversight.
- Develop a new scheme of financial delegation. (to also address the issue of Budget draw down with additional support via a senior accountant and mandatory finance training for project managers)
- Develop tools and methodology for categorisation and Tiering.

#### **Outcomes/Benefits**

- Overall prioritisation of Portfolio activity
- Removal of BAU from the Portfolio Ecosystem
- More robust and accurate business cases
- Only feasible projects and programmes enter the Member arena.
- Improved analysis and grip on project and programme risk and complexity

#### **Changes required:**

- Standardised Opportunity Framing template (see Blueprint Annex for example)
- Assessment tools to be developed in implementation using objective criteria based on the priorities and needs of the Corporation (see Blueprint Annex for examples)
- Standardised Business Cases to be developed (see Blueprint Annex for examples)
- Develop a new scheme of financial delegation to support and underpin this process (see example in Blueprint Annexe). This will need to be developed in parallel with the Chamberlain's Transformation programme.

We have provided examples to illustrate the recommendations, however these products will need to be further defined and developed in implementation to best meet the needs of the Corporation in conjunction with key stakeholders such as Members and Chamberlains, for example.

#### 4. Proposed - Skills and capability.

Understanding of organisational capability (PMO ecosystem) to deliver improvement plan inc. skills analysis.

The review team carried out a skills and capability survey to establish a baseline view of skills and capability within the organisation to inform what would be needed to support a portfolio approach to deliver the City of London improvement plan. The survey consisted of 35 questions, mostly multiple choice but with some free text boxes to provide both qualitative and quantitative data. This was sent to 70+ project and programme managers across the corporation and the institutions. 52 people responded which is statistically significant. The survey highlighted some good skills and capability but also a number of significant gaps. This was further evidenced through the stakeholder engagement activities.

Key quantitative data from the survey showed the following:

- Gaps in skills and capability for programme management, SRO, Change Management and Benefits Management.
- No evidence of skills or qualifications in portfolio management
- Good skills and capability in Project Management.
- Staff would welcome further training on programme and project management.
- Most projects are high risk or high value.

Key qualitative data showed:

- Change control management is elongated and unnecessarily complicated.
- Unhelpful level of gatekeeping
- Many projects and programmes are managed on top of the day job, which reduced capacity to do project management well and has led to stress and impact on health.
- Managing multiple stakeholders is a challenge.

#### Proposed

To support your PPM staff in their professional development and build internal capability, it is suggested that the corporation look to adopt a standard framework for key PPM roles which define core competencies and behaviours.

#### **Recommended actions.**

If you wish to move to a structured and comprehensive portfolio model, it is key to ensure the right skills and capability are in place. In the first instance this would involve conducting an organisation wide TNA.

To achieve this, it is recommended that you invest in your staff and adopt a structured and focused L and D model. You have in place the PM Academy which would provide an excellent building block for upskilling of PM's should you choose to continue with it. A suggested framework route would be to align with the Government Project Delivery Capability Framework. This is an excellent tool that describes job roles, capabilities, and learning, for project delivery professionals across government. It contains four elements:

- A career pathway/ common set of job roles
- A set of competencies
- A signpost for development opportunities specific to job roles
- The criteria and process to obtain accreditation as a Government Project Delivery Professional

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1124745 /PDCFv3.pdf

#### **Benefits** /Outcomes

- ✓ Workforce skilled to do the work efficiently and effectively.
- ✓ Career pathway to support retention of talent pool of skilled people to delivery projects and programmes.
- ✓ Skills and capabilities to meet the corporation's strategic objectives.

#### Key change required.

✓ Move to working within a structured L & D framework and Consider PM Academy to support.

#### 5. Proposed - Community of Practice (PLG)

#### Proposal for future of project leadership group (community of practice)

The team carried out a Review of the Project Leadership Group terms of reference and membership, had discussions with PLG members and carried out a desktop review to inform options for the future of the group.

We found that the Project Leadership Group is currently operating as a Best Practice Community of Practice for senior officers and has a noticeably clear set of accountabilities and objectives. They have only had a couple of meetings in the current format so there is no measure of success to date. PLG have little power and influence over changing any processes or rules but can change tools and templates that sit within processes. The Corporate Projects Board role, also an officer board, has more influence and power and needs to be considered in the context of the future of a COP so there is not duplication of activity.

Discussions at various workshops across the organisation and with Institutions indicated that project managers would also value a community of practice as a forum for sharing everyday work issues and as an opportunity for peer learning. (Helping Community of Practice)

#### Recommendations

In suggesting the future role for a COP, it is recommended that:

You consider the immediate requirement to support the transformation programme as it moves towards implementation. The PLG could repurpose to focus on supporting this activity, and its role may need to continue to flex as implementation progresses. Specifically, it could:

- Act as a mechanism for raising awareness of any changes during implementation of the Portfolio Ecosystem and taking a role as change champions. Being the driving force for the changes required to aid the transition to the new ways of working. Play a role in cascading information to teams.
- Use the group meetings as space to collaborate, innovate, challenge, and reflect and plan how they will prepare the ppm community for the change.
- Provide vital support to defining the EPO service catalogue and associated tools and templates supporting the move towards a Portfolio ecosystem.
- The PLG role should be considered in the context of the role of the Corporate Projects Board (CPB) going forward so there is no duplication of effort or accountability.

It is also recommended that you look to establish smaller communities of practise so information from the PLG can be cascaded to them directly, as part of the change management in implementation. The project managers, in their stakeholder workshops, reflected that they would value a community for practice to share learning.

#### **Benefits and outcomes**

- Improved project performance: By sharing best practices, tools, and techniques, a PM CoP can help project managers to improve their skills and knowledge, resulting in better project performance, reduced costs, and improved outcomes.
- Knowledge sharing and retention: A PM CoP provides a platform for project managers to share their knowledge and experience, which helps to retain critical knowledge within the organization. This is especially important when project managers leave the organization or retire.
- Improved collaboration: A PM CoP encourages collaboration between project managers and other stakeholders, leading to better communication, coordination, and alignment across the organization.
- Increased innovation: A PM CoP can foster a culture of innovation by providing a forum for project managers to share new ideas, approaches, and technologies, and to experiment with new methods and tools.

- Reduced risk: A PM CoP can help organizations to identify and manage project risks by sharing lessons learned and best practices, resulting in fewer errors, delays, and cost overruns.
- Professional development: A PM CoP can provide opportunities for professional development, such as training, mentoring, and coaching, which can improve employee satisfaction, engagement, and retention.
- Improved organizational performance: By improving project performance, knowledge sharing, collaboration, innovation, risk management, and professional development, a PM CoP can ultimately contribute to improved organizational performance, competitiveness, and sustainability.

In summary, a PM CoP can provide a range of benefits to an organisation, including improved project performance, knowledge sharing and retention, improved collaboration, increased innovation, reduced risk, professional development, and improved organizational performance.

#### Key changes

- ✓ Invite further discussion with PPM colleagues to understand what they need from a community of practice to help shape its role as it goes forward.
- ✓ Refocus ToR so the group has a role and accountability in shaping and delivering the change.

#### 6. Proposed - funding for PM Academy

Proposal for future of Corporation PM Academy

#### Current

The team carried out a review of the existing funding model, had discussions with the project team who set up PM Academy and explored options for future funding model.

In addition, during the various workshops held, further insight was gleaned from stakeholders about their views on the PM Academy.

We found the PM Academy to be a well-constructed model with a clear pathway, set up to deliver good, accredited training, customised to the organisation.

- It is valued by those in the organisation who have undertaken the training. (evidenced through stakeholder interviews and workshops)
- Its set up and initial delivery was via the PMO lead as a project (15 modules delivered x6)
- Believed to be funded as a project with no ongoing budget (Not able to confirm)

The course has not been run since 2020 due to:

- Lack of resource to administer people and funding.
- TOM work was due to look at ownership /delivery of the training in the wider context this work has not yet provided an outcome.

Current costs for PM Academy - £10K which includes:

- Fifty licences
  - Administration / hosting
  - Accreditation to APM
  - There is an additional cost of £400 / module.
  - The course consists of 15 modules and each module has a 30-45 minute video and a live session with external trainer (classroom/virtual)
  - Minimal input is required to start it running again as the bulk of the development work has been done.
  - It may need some adjustments to reflect changes in practices over the last two years.
  - If a portfolio approach is adopted, the content would need to reflect the changes in approval routes and other enhancements to support the new way of working.
  - Costs would need to be factored into any changes.

Currently the following is not clear:

- Which service owns the training module?
- Where the budget would come from for ongoing delivery
- How it would be resourced to administer the training and to develop any changes

#### **Options on Funding models**

We considered all the information gathered including feedback from stakeholders and propose the following options:

**Option one** - Recharge each directorate (including institutions) for individuals that attend to support development, hosting, and maintenance. This would provide an ongoing funding stream for hosting and maintenance but would impacts on service budgets.

**Option two** - Cost each project and programme so that a specific portion or percentage is allocated to the PM Academy for development, hosting, and maintenance. This would create a funding stream to support the PM Academy and could be capitalised against the project so less impact on service budgets. This would need to be agreed with L&D.

**Option three** - Offer training outside the organisation – the following would need further consideration to support the development of a 'go to market' proposal:

- Is your current training model maturing enough to support offering training externally.
- What is your value proposition for this training / why should they come to you.
- How will this be funded, administered, and costed.
- How will you build awareness of the training and how will you track its success.

• Who is your customer – inside the organisation you have a defined customer base, how will you target your audience externally.

#### **Recommendations on Funding**

Options 1 and 2 of the funding models are considered and costed up in detail for best comparison. External training should be a longer-term aspiration for when the Portfolio Ecosystem and good ppm governance standards are more mature. At which point the organisation is demonstrating high standards of PPM delivery to showcase as part of this external offering.

Assess the level of demand for PM Academy training for project managers as the skills survey indicated a good level of project management skills and capability within the organisation. Programme management capability in this survey was low. This will help inform if it would have a return on investment. The skills survey showed 35 out of the 55 who responded had more than 5 years PM experience and most of these had a PM qualification.

#### **Recommendations on Ownership**

Should the PM Academy be reinstated, it is recommended that initial ownership could reside withing the Centre of Excellence function as part of the Portfolio Office. It should however be linked to HR and L& D with a view to it being part of the wider corporate training portfolio and aligned to any PPM job descriptions. This will ensure the PM Academy has clearly defined learning objectives and outcomes and effectiveness of the training program me is evaluated and feedback fed into future iterations.

#### **Recommendations on Learning Modules**

The training offer for PM Academy should be reviewed to establish if it needs to be pivoted to meet demand in other areas such SRO/change management / finance where there is currently a gap. Additional costs for development would then apply.

A budget should be set for the PM Academy, which should include:

- appropriate FTE to administer the PM academy and to measure and assess the impact of the learning intervention. (approx. 1 day / week)
- sufficient funding to allow for PM Academy development of new modules, hosting costs and updating as processes change. (Cost of changes and approx. 1 FTE / week to deliver)

This is an estimate based on all fifteen modules being run 3 x / year.

#### **Benefits and outcomes**

In-house project management (PM) training courses can be an effective way to support an organization's project portfolio management (PPM) community. Potential benefits:

- Consistency: In-house PM training courses can ensure that all members of the PPM community have a consistent understanding of project management principles, processes, and tools. This can improve communication and collaboration among team members, as well as the quality of project deliverables.
- Tailored content: In-house PM training courses can be tailored to the specific needs and challenges of the organization's PPM community. This can help to address gaps in knowledge and skills, as well as provide opportunities for professional development and career growth.
- Enhanced team building: In-house PM training courses can provide opportunities for team members to learn together and build relationships, which can improve collaboration and teamwork across the PPM community.

Overall, in-house PM training courses can be an effective way to support an organization's PPM community, improving consistency, knowledge retention, and team building, while also being cost-effective and tailored to the organization's specific needs.

#### Key change

✓ Set up L& D process for training – PM academy to be considered as part of this alongside options to expand remit of PM Academy

#### 7. Proposed - PPM Systems and Reporting

Proposal for effective project systems and reporting

#### Current

A range of stakeholder workshops were conducted to understand the current position for PPM systems and reporting. These reflected that the current IT system used to manage projects does not effectively support project management activities is out of date and not used robustly, therefore hampering efforts to deliver a portfolio function. It also lacks some tools, templates, and integration with other systems, which can create challenges in managing projects in a consistent and efficient way. Additionally, there are resourcing implications for making improvements to the system despite an upgrade being available and paid for. Compounding this, there is only one individual who has the expertise to complete updates and provide system support which is a single point of failure.

Reporting practices and templates also appear to be inconsistent across projects, with information often missing and the level of detail provided is not always appropriate for the audience. For example, committees get too much detailed information. Good project management practice involves the use of a RAID log for tracking Risks, Issues, Assumptions and Decisions and at present there are gaps in this practice. Decisions are embedded in committee reports, which often results in the Town Clerks office having to track back through multiple reports to find these.

Stakeholder workshops highlighted that project managers use a range of different tools for project management including, excel spreadsheets, MS project, PowerPoint and contractors do not have access to necessary systems so MPMO officers have to do it for them.

#### Proposed

Implement an effective IT system to manage PPM and portfolio reporting in the Portfolio Ecosystem.

#### Recommended

It is recommended that you implement an effective IT system to manage projects as an important step in improving the Corporation's portfolio management approach. The system should be able to provide a centralised and standardised platform for managing all projects and programmes, including the ability to capture data on project performance, resources, risks, issues, decisions, and dependencies.

The system should also be able to generate standardised templates to support the Portfolio Ecosystem. Additionally, there should be a centrally located file store for saving key project documents such as project initiation documents, business cases, and project plans which the new EPO is able to access. This will ensure that all projects and programmes are following a consistent approach, making it easier to compare, assess and track progress. The IT system should also be designed to support the new Portfolio Management framework, with features such as dashboards for monitoring project performance, alerts for risks and issues, and the ability to track dependencies and benefits, as well as ensure integration with finance systems. It should also be user-friendly and accessible to all project teams, making it easier to collaborate and share information.

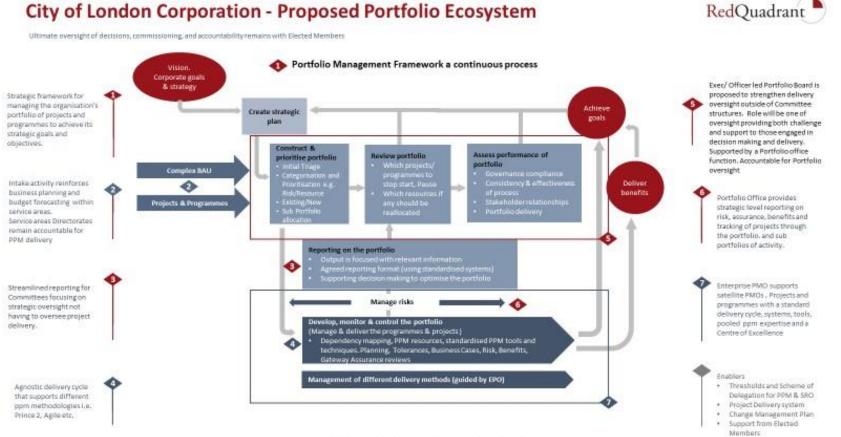
We worked with stakeholders to identify the potential options available for an effective IT system. This is a core foundational capability that would need to be in place so any decision would need to be taken in view of the Corporations urgency to move to a portfolio management approach. The most time and cost-effective options is to upgrade the current Project Vision system to the web version which is already paid for. **Proposed Benefits:** 

- ✓ System supports a portfolio management approach and brings the organisation closer to achieving that vision.
- ✓ It would provide a centralised location for capturing key project documents.
- ✓ It would provide greater opportunity for staff to collaborate.

#### Key changes required.

- $\checkmark$  Requirement to plan for an implementation with costed resource to deliver.
- ✓ Considerable work will be required to set the system up (design) to meet project and reporting requirements.

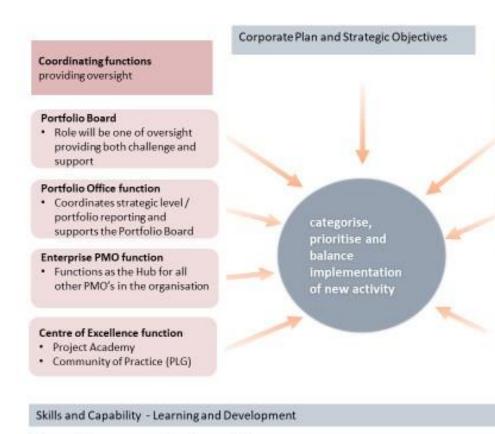
#### Figure 1 - Portfolio Operating Model



Portfolio Management Framework Overview 2019

**Note:** BAU/Cyclical activity could be tracked, monitored, and reported via the Portfolio Office as Sub portfolios of work. It would however not drop down into section 7 which incorporates new programme and project management practices – Portfolio Deliver.

# Building Blocks - Proposed Portfolio Management Ecosystem



Change Management - Transformation Team

Delivery Management Standardised across the Organisation

#### PPM Systems and Reporting

Tools, templates and IT systems

#### **Project Financials**

- Project Definition Threshold
- Scheme of Delegation

#### Projects procedure aligned to Government functional standards for PPM delivery

- Definition and categorisation
- Roles and Responsibilities
- Assurance
- Risk Management
- Project and
  - Programme governance

A portfolio management ecosystem would make it possible to compare individual projects and see them as part of a bigger picture.

The would be supported by the coordinating functions and an enhanced projects procedure.

In turn this would help to create the conditions for addressing the other challenges such as systems and processes, assurance, risk mgmt. and delivery capability in a more effective way.

In the proposed new process, there are additional levers that sit outside of this review, related to financial thresholds and a Scheme of Delegation. These levers will play a key role in shaping the success of the Portfolio Ecosystem.





City of London Corporation

**Draft Outline Project Governance Framework - July 2023** 

# CONTENTS

# Introduction

This document sets out the proposed model for the new Corporation of London portfolio management framework. It has been developed based on the recommendations of the external review undertaken by RedQuadrant and, if approved, will form the basis for the detailed development of a new COL Project Procedure and Project and Programme Management (PPM) toolkit.

The proposals set out in this document and designed to strengthen our governance and assurance frameworks to better support Elected Members in the strategic oversight and risk management of the Corporation's project portfolio.

The proposals set out, represent a significant change to current ways of working and will require the engagement and cooperation of all parts of the Corporation in order to achieve success. Consequently, the further development and implementation of any proposals will be supported by proactive communications and a comprehensive change management plan.

# What's covered by this approach?

### Definitions

	What is it?	How is it managed?			
Project	A series of tasks which need to be completed to achieve a specific outcome, requiring a set of inputs and outputs to reach a particular goal. (A project isn't something that is part of normal business operations (BAU))	Project management uses processes, methods and training, together with knowledge and skills of the project manager and team to coordinate and deliver the required outputs			
Programme	Programmes are a group of related and interdependent projects and change management activities that will deliver beneficial change	Programme management involves managing interdependencies across projects, prioritising and budgeting, and ensuring resource capacity and capability across the programme.			
Portfolio	The aggregation of projects and programmes within an organisation aligned to strategic priorities	Portfolio management includes the selection, prioritisation and control of projects and programmes which are aligned with the organisation's strategy and objectives.			
Business As Usual (BAU)	Activity that is part of normal day-to-day operations and all activity with a total value of less than £250k	Operational management is the management of those activities that create the core services or products provided by an organisation.			

#### What's included in this definition?

For avoidance of doubt, the COL definition of projects and programmes will include both capital and revenue funded activity. This means activities such as business and service transformation will, from now on, be managed as projects/programmes.

A core principle of this approach is the decoupling of portfolio management from financial controls. This requires effective operational management process to be developed to facilitate robust management of BAU.

# Introducing 'Portfolio Management'

Portfolio management enables organisations to understand delivery as a whole, developing a deeper understanding not only of individual functions but also their interdependencies. Introducing portfolio management will enable COL to make far more informed and effective decisions. This will support Elected Members to ensure projects, programmes and initiatives are aligned with COL strategic objectives and goals by selecting, prioritising, and managing the projects and programmes that deliver the most value.

The portfolio management framework set out in this document has been designed to enable the most effective balance of organisational change and business as usual. As such, recognising COL level of maturity and the need to develop internal capabilities over time, three levels of portfolio views will be introduced in the first instance.

This will include:

- **Corporate Portfolio** providing Members and the Executive Leadership Board with corporate visibility of the aggregate investment, risk and benefits of the entire COL portfolio of projects and programmes
- Strategic portfolios bringing together activity that spans multiple projects and programmes, particularly where they are being delivered across multiple COL departments or institutions. Existing examples include the Climate Action Strategy and the Future Police Estate (see X for short case studies)
- Chief Officer portfolios department/institution views delivering a comprehensive overview of resource allocation and risk management across all projects and programmes within a service area.

# Determining whether activity is a project, programme or BAU

#### Assessing activity

The first step after identifying the need to deliver activity will be to determine whether or not the project procedure applies. To aid with this determination and to ensure consistency across COL, a simple tool has been developed. This tool can be accessed here Prototype Portfolio Assessment Tool 23_06_15.xlsx

**BAU** –activity that is low value (sub-£250k) or is assessed as BAU, will remain the responsibility of the relevant Chief Officer. It is recommended that, where appropriate, the corporate tools and templates are used to support the effective management of this activity, however, governance requirements will remain local and should be managed in line with the Financial Scheme of Delegation. All Chief Officers must ensure that appropriate local processes are in place to review progress and manage risks. The Enterprise Portfolio Management Office (EPMO) will provide advice and support to help establish these processes. The EPMO may also request evidence of robust processes in their corporate assurance role.

#### TOOL QUESTIONS - BAU

- Is this activity a one-off purchase, contract renewal or other transaction already covered by standard procurement processes?
- Is this activity cyclical?

**Project** – activity over £250k that is defined as a project must be managed in line with the requirements set out in the project procedure. Subsequent sections of this document provide further guidance regarding the tiering of projects and the requirements for the effective management, monitoring and reporting of projects dependent on value, risk and complexity.

#### **TOOL QUESTIONS - PROJECTS**

- Is this activity a change to existing business processes, operations or technology?
- Is this activity creating a new asset or service?
- Is this activity time-limited with a specific outcome to deliver within a set budget?

**Programme** – the identification of programmes is important to support the effective reporting of outcomes and intended benefits.

#### TOOL QUESTIONS - PROGRAMME

 Is this activity made up of separately managed projects which have dependencies on each other in order to achieve the overall objective?

# **Project tiering**

The new Project Procedure will establish a three-tier model for the effective management of projects. The governance and assurance requirements for the three tiers are scaled in order to ensure proportionality according to the value, risk and complexity of the project and its intended outcomes.

A detailed assessment tool has been developed to ensure consistency in the tiering of projects. It should also be used to effectively manage the project throughout its lifecycle through regular review of risk factors. This means that a project's tiering may not be fixed and a project may be escalated or de-escalated over its lifetime dependent on the changing risk profile.

The assessment tool is available here <u>Prototype Portfolio</u> <u>Assessment Tool 23_06_15.xlsx</u>

### Complex projects (tier 1)

These projects are generally high value (over £20m), are strategically important (fundamental to the successful delivery of a strategic objective), delivery is likely to be complex (involves novel activity requiring innovation, high degree of uncertainty or, is a significant change to established practices) and, have a significant direct impact on people (staff and/or community).

### Strategic projects (tier 2)

These projects are generally over £2m (but less than £20m) in total value, contribute to strategic objectives, delivery approach

is fairly certain with few areas of uncertainty and, impact to people is moderate or limited to a defined group of people (staff and/or community).

### Routine projects (tier 3)

These projects are generally under £2m in total value, are aligned to strategic objectives but with no significant contribution to overall success, delivery is straightforward and, there is minimal impact on people (staff and/or community).

Summary:

✓ high value (£20m+)
✓ delivers strategic outcomes
✓ complex to deliver
✓ high levels of uncertainty
✓ Requires new or innovative practice
✓ significant impact on people
✓ Mid value (£2m-£20m)
✓ Contributes to strategic outcomes
✓ Some uncertainty exists
✓ Requires some technical innovation
✓ Moderate impact on people
✓ Low value (£250k-£2m)
✓ Aligns to strategic outcomes
✓ Clearly defined delivery approach
✓ Requires little innovation
✓ Minimal impact on people

Additionally, it is recognised that major capital infrastructure projects (likely to be in excess of £100m total project value), may require focussed scrutiny and strategic oversight of project delivery as well as alternative methods of financing. Therefore, it is proposed to create sub-set of tier 1 projects, referred to here as tier 0. The PPM requirements and criteria for tiering remain the same as the rest of the tier 1 (complex) projects, however, governance arrangements may differ, particularly if special purpose vehicles are developed.

# PPM toolkit

A new PPM toolkit will sit alongside the Project Procedure. It is important to understand the purpose of and distinction between the two documents. The Project Procedure will determine the appropriate project governance whilst the PPM toolkit will support effective project and programme management. Project governance should not be confused with project management. Project governance deals with the strategic management and governance of a portfolio of projects to deliver business value. Project management, on the other hand, manages projects on a day-to-day basis, making any decisions that have to be made based on the scope they have been given by the project board.

The tiering of projects will not only determine the necessary governance but also identify the mandatory requirements for effective project management. A comprehensive PPM toolkit will be developed which will include mandatory artefacts (templates) and roles for all COL projects. The table below sets out further detail regarding the requirements and their adoption this will be further developed in implementation.

Requirement	Description	Mandatory		
			Strategic (tier 2)	Complex (tier 1)
Documentation				
Project or Programme Brief	The programme brief is an outline definition of what a project/programme is expected to achieve in terms of benefits, outcomes, scope and objectives. It sets out the strategic intent and describes how it aligns to corporate priorities.	Yes	Yes	Yes
Project Initiation Document (PID)	The PID should clearly articulate the line of logic between objectives, deliverables, programme plan, key risks, stakeholders and project/programme governance (including gates)	No	Yes	Yes
Outline business case (OBC)*	The business case provides justification for undertaking a project or programme. It evaluates the benefit, cost and risk of alternative options and provides a rationale for the preferred solution. Business cases should contain costs and benefits and cashflow analysis. Outline business cases are typically produced at the early stage of feasibility and as such contain a level of uncertainty.	Yes	Yes	Yes
Full business case (FBC)*	The OBC should be further developed as feasibility progresses and further certainty emerges. At the conclusion of feasibility the Full Business Case should be developed and form the basis of the decision to continue the project or not.	No	Yes	Yes
Project or	High level and detailed insights to the programmes tasks, timelines, resources and critical	Yes	Yes	Yes

programme plan	path. For a programme this will would normally require a gantt chart. The programme plan should be approved at the programme's board from which it becomes baselined			
Governance ToR	A terms of reference for the Governance of the programme, this will include Objectives, Meeting Membership, Chair, Gatekeeper, Frequency, Inputs and Outputs. It should articulate expected behaviours. Everyone on the board needs to understand their role	Yes	Yes	Yes
Roles and responsibilities	A document that will outline the roles, responsibilities and the relationships of key people within a programme. Should clearly articulate accountable and responsible roles. The roles and responsibilities should articulate where BAU/Operational resource is required and the means of handling resource conflicts	Yes	Yes	Yes
Product descriptions	A clear description of each of the deliverables for the programme with dates of delivery	No	Yes	Yes
RAID	Capturing and managing issues, risks (i.e. threats and opportunities), dependencies and assumptions that the programme of project has made	Yes	Yes	Yes
Benefits management strategy	The documents defines the framework within which benefits realisation will be achieved as new capability is implemented. This should articulate where a programme is enabling and responsibility for achieving the saving resides within a department. A benefits map should be utilised where for example the programme delivers social value	No	Yes	Yes
Progress report	A dashboard that will show the progress of the report. Elements include top risks and issues, timelines, status of deliverables and actions	Yes	Yes	Yes
Transition plan	A document that provides a detailed operational plan for the transition of the service from its existing state to a transformed one. A "business readiness" checklist and plan will need to be produced	No	Yes**	Yes**
Change management strategy	A document clearly setting out the approach to managing change and engaging with key stakeholders. This should consider evaluation methods in order to test buy-in and organisational posture in regard to the project's aims and objectives.	No	Yes**	Yes**
Management syste	ms			
Corporate PPM system	Portfolio management system used to manage individual projects and for portfolio reporting.	No	Yes	Yes
Agile tools	Depending upon the nature of the programme or project agile artifacts can be developed – MoSCoW prioritisation, backlogs, agilemoter, scrum roles, sprint backlogs, Burn charts, WIP boards etc	No	No	No
Roles				
Project	Officer accountable for successful project delivery and delivery of the objectives set out in	No	Yes	Yes

Sponsor/SRO	the business case. Responsible for ensuring adequate resources are available to deliver the project. For tier 1 projects, this is likely to be a Chief Officer			
Dedicated Project Director or Manager	Officer responsible for delivering the project and for providing operational day-to-day direction to project team members.	No	Yes	Yes
Change Manager	Officer responsible for supporting and facilitating the change process. Leading on engagement activity and communications with key stakeholder's. Contributes to the definition, monitoring and measurement of qualitative project benefits.	No	No	Yes**
Benefits Manager	Officer responsible for defining, monitoring, measuring and communicating the delivery of project benefits.	No	No	
Named finance lead	Finance representative	No	Yes	Yes
Named EPMO analyst	EPMO representative	Νο	Yes	Yes
Project/Programme Board	Supports the SRO for delivery of the project and acts as the decision making board taking decisions in line with levels of delegated authority or recommending decisions to the appropriate body.			

*NB – tier 0 large capital infrastructure projects are likely to follow the HM Treasury (Green Book) 5-stage business case model. This requirement will be set out in the project brief document.

**Mandatory elements for business change/transformation projects and programmes

# Portfolio governance

The Corporation will introduce a single cohesive project governance framework to manage all its projects. This framework is intended to be proportionate and to flex to the breadth and variety of projects that the Corporation delivers.

## Member governance

Members play an integral role in an effective portfolio governance framework. Members have the overall responsibility for setting strategic objectives and identifying political priorities. This underpins all decision making in the proposed model.

Members also represent the highest form of governance and scrutiny within the organisation and this model will ensure Members are enabled to focus on the projects of the most strategic importance, predominantly tier 1, complex projects. Tier 2 projects may be escalated to Members on the recommendation of the Portfolio Board.

However, through improved reporting and the development of the COL portfolio view, Members will, for the first time, have enhanced visibility across the organisation's project portfolio in its entirety and in a clear, easy to digest format (e.g. dashboards). This will allow Members to scrutinise and provide challenge of investment and resource allocation, strategic risk management and organisational performance.

The shape and form of Member governance, i.e. Committee structures, will be informed by the independent review currently

underway. This document therefore focusses on general principles of Member governance rather than specific structures.

However, it is important to recognise Member governance relating to projects takes place through two separate but related roles. The proposed model will seek to support improved corporate understanding of these roles based on the principles set out below:

Service committees – focussed on answering the question "are we doing the right thing?". In other words, what is the need for this activity? How does this align with strategic objectives? And, will this approach deliver the outcomes required?

Project decision making committees – focussed on answering the question, "are we doing things right?". Will the proposed approach to project delivery and management deliver success? Does the proposed approach represent Value for Money?

# Officer governance

# Portfolio Board

The Portfolio Board will support Members and provide assurance and confidence that effective project management controls and systems are in place. It will support more effective prioritisation by taking a collective and cohesive view across all Corproation project-related activity. The Board will also act as a gateway to Member Governance providing challenge and ensuring the quality and integrity of information provided to enable Members and committees to focus on more significant, strategic decision making.

The Board will be responsible for:

#### Routine projects – tier 3

- Provide peer challenge to the proposed Chief officer portfolio on an annual basis
- Receive Chief Officer portfolio summary on a quarterly basis
- Provide effective challenge and scrutiny of underperforming tier 3 projects as part of a Chief Officer portfolio view (red rated projects or those rated amber with red risks relating to budget, time, outcomes)

Strategic projects – tier 2

- Review and approve the outline business case and project initiation document
- Review and approve full business cases for projects valued £5m or less
- Review and recommend for approval by Members, the full business cases for projects valued above £5m
- Receive regular chief officer portfolio summary on a quarterly basis
- Monitor project performance by exception (projects rated amber with red risks relating to budget, time, outcomes)
- Provide initial challenge and scrutiny of red rated projects before escalation to Members
- Identify potential solutions and/or required corporate intervention for red rated projects

Complex projects - tier 1

- Review and recommend for approval by Members,

project charter, outline business case (over £5m), project initiation document and full business case

- Receive and scrutinise monthly project dashboards
- Provide project highlight reports to Members
- Provide initial challenge and scrutiny of amber (with red risks) and red rated projects before escalation to Members
- Identify potential solutions and/or required corporate intervention for underperforming projects

The successful operation of the Board will require a delegation to Town Clerk (as Chair of Portfolio Board) and/or appointed SROs to approve projects up to £5m.

The Board will be supported by a sub-group chaired by the Chamberlain. The Chamberlain's Programme Assurance Group will support the effective corporate overview of the Corporation's most complex/high value projects (predominantly tier 0). The Board will co-ordinate affordability considerations and financial risk considerations, assessing impact on the MTFP and advising on prioritisation in order to ensure the Corporation's financial sustainability.

Please refer to the supplementary information at end of this document for draft Portfolio Board terms of reference.

### Formalising the role of the SRO

The Senior Responsible Officer (SRO) is an important role as they are the single officer accountable for the project/programme, ensuring it meets its objectives and realises the expected

benefits. All tier 1 and 2 projects must have a named SRO. For tier 1 projects this would usually be at Chief Officer level. SROs of the City's complex projects are directly accountable to Members and must report delivery progress to Members.

The SRO is the owner of the business case and is accountable for all aspects of governance. The responsibilities of the role include:

- articulating and communicating the vision and business objectives of the programme
- ensuring a real business need is being addressed
- assuring ongoing viability, and if necessary taking the decision to recommend stopping the programme
- securing the support and input of key external and internal senior stakeholders, including the Programme Board
- appointing, chairing and setting priorities for the Programme Board
- providing the team with clear leadership, decisions and direction throughout the programme's life
- maintaining alignment of the programme with the organisation's strategic direction
- ensuring the delivered solution meets the needs of the business

Please refer to the supplementary information at end of this document for draft SRO agreement document.

Key roles summary –

_			
	Elected Members	-	Strategic leadership and overall accountability for effectiveness of the COL portfolio Ensure investment aligns with strategic priorities Provide oversight of the most complex, high value and high risk projects Responsible for taking decisions for tier 1 projects Provide a point of escalation Hold officers to account for operational project management and delivery
	Portfolio Board		Executive-level board Chaired by the Town Clerk responsible for assuring the effectiveness of the COL portfolio Makes recommendations to Members regarding investment and strategic alignment Provides oversight of tier 2 projects Hold Project Directors/managers to account
	Chief Officers/	-	Accountable for the Chief Officer portfolio and prioritisation within their service area Ensure compliance with project governance framework within their area of responsibility

Sponsors/SROs	<ul> <li>Appointed by Members for Complex projects (likely to be a Chief Officer)</li> <li>Accountable for ensuring effective project management processes and controls are in place</li> <li>Accountable for ensuring interdependencies are effectively managed and a programme established</li> <li>Accountable for project budget</li> </ul>	EPMO
Project/Programme Board	<ul> <li>Support the SRO to provide overall direction and management of the project/programme</li> <li>Enable effective and auditable decision making and change control</li> </ul>	
Project Directors/Managers	<ul> <li>Responsible for effective management of projects</li> <li>Responsible for managing project budget, identifying risks and</li> </ul>	

EPMO	- Central organisation responsible for
	enabling effective portfolio,
	programme and project
	management.

# Portfolio gateways

The new Project Procedure will include a refreshed approach to the gateway process. This approach will apply to all projects regardless of value. However, the governance of the gateway approach will be dependent on the tier of the project, with Members primarily focussed on tier 1 – complex projects – governance.

The new approach will also reduce the volume of information required, moving away from the narrative heavy committee style reporting and making more effective use of dashboard reporting. For low value projects with no significant issues, it is anticipated that approval will be sought as part of a portfolio summary.

The table below summarises the new gateways and the key focus at each stage.

Project lifecycle stage	Gateway	Key decision/products
Define	Idea generation	Project Brief
	Scoping	Outline business     case
Discover	Concept development	• PID
	Business case	• Full business case
Design	Readiness for launch	Delivery plan
Deliver	Monitoring delivery	Progress reports
Realise	Exit	<ul><li>Lessons learnt</li><li>Closure report</li></ul>





Reviews against delivery reporting & investment criteria Checkpoint Reviews against delivery reporting & investment criteria

## **Project leadership**

#### EPMO

Building on the establishment of the Project Governance Division as part of the TOM, the new model will establish an Enterprise Portfolio Management Office (EPMO). The key functions of the EPMO will include:

- Developing a Centre of Excellence a central hub setting the professional standards, capability, guidance, tools and templates for the Corporation
- Portfolio management reporting, risk management, assurance checks
- PMO project delivery support, project governance
- Benefits realisation social value, benefits management

The EPMO will work closely with the Transformation and Improvement team (within the same Division), to ensure effective change and delivery support is provided. This will include a flexible resource pool that can be deployed to support project launch and to provide targeted corporate intervention to any projects with significant issues and/or risks to delivery.

The proposed structure for the new service is the subject of a separate report which also proposes the integration of the Project Governance Division with the Commercial service.

#### **Head of Profession**

The new service Director will be the head of profession for:

- Portfolio, Programme and Project Management
- Transformation
- Continuous improvement

The head of profession responsibilities may be delegated to Assistant Directors and/or Heads of Service within the Division.

#### Hub and spoke model

The EPMO will be the Corporation's primary project management office and the Director, as head of profession, will provide professional leadership through a dual reporting line to all other Corporation project delivery and/or PMO functions.

#### Leadership of the wider project community

A Project Leadership Network, chaired by the Director, will be set up. The aim of this network will be to bring together project leaders from across the Corporation focussed on driving continual improvement and development of internal capabilities. They will be supported by a PPM Community of Practice and the Change Champions.



#### **PPM Community of Practice**

Project and Programme Management Community of Practice – a virtual network of all officers across the Corporation involved in the delivery of projects and programmes. The network will provide a forum to share best practice, to seek peer support, to disseminate information and share learning opportunities.

#### **Change champions**

A network of change agents from across the Corporation sharing best practice, knowledge and learning.

#### **Professional standards - Skills and capability**

The EPMO will establish clear professional standards relating to PPM for the Corporation. This will identify the roles and competencies required to achieve excellence in portfolio, programme and project management. This will be supported by a refreshed Project Management Academy with additional learner types.

#### The Project Management Academy

The PMA will be refreshed and additional content developed to better support the range of roles involved in effective portfolio management.

Learner type	Existing PMA capability	Target learner
Leader	*new	<ul> <li>Decision makers including</li> </ul>
		tier 1 SROs and Elected
		Members
Specialist	Advanced	<ul> <li>Qualified/professional PMs</li> </ul>
		Tier 1 PMs
		<ul> <li>Officers working in</li> </ul>
		Corporation PMOs
Manager	Practitioner	• Tier 2 PMs
Analyst	*new	<ul> <li>Additional module(s)</li> </ul>
		focussing on analytics and
		reporting
Support	Foundation	• Tier 3 PMs
		Officers providing project
		support roles

A mandatory portfolio management induction will also be introduced for all officers who will be working on Corporation projects. This will include consultants and/or interims.

# Portfolio assurance and reporting

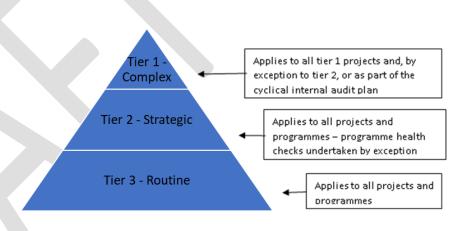
#### Three lines of assurance

A three lines of assurance model will be implemented to provide assurance regarding management and delivery of COL projects. A description of each of these lines is provided below:

	-
1 st line assurance	The PMO will carry out first line
	assurance, amongst other
	responsibilities, to ensure operational
	management and delivery is consistent.
	All staff are responsible for delivering in
	line with corporate standards.
2 nd line assurance	The Centre of Excellence set
	standardised project, programme and
	portfolio tools, processes and guidance
	in place for all staff to support delivery.
	They are responsible for second line
	assurance providing independent
	assessment and ensuring first line
	arrangements are in place and operating
	as intended.
3 rd line assurance	Carried out by the internal audit

function.

The diagram below illustrates how these three lines will apply to projects/programmes at each of the three tiers.



#### **Check point reviews**

As part of the Gateway process, the EPMO will work with project managers and SROs to complete check point reviews. This will ensure all projects/programmes are ready to be presented for decision and that key risks and implications of any decisions have been identified and appropriately articulated before proceeding to the next stage.

In addition to the check point reviews, health checks will be undertaken on all Tier 1 projects on an annual basis to provide assurance that effective project management arrangements and controls are in place. This will ensure greater consistency in terms of breadth, depth and level of assurance across the portfolio. In addition to planned health checks, consequential

#### Programme health checks

health checks may also be undertaken in response to a particular event or concern. This could mean assurance activity in the form of a 'deep dive' to establish what actions/corporate interventions cold be undertaken to find improvements. Consequential health checks could be undertaken for both Tier 1 and Tier 2 projects where significant risks and/or issues that have been identified.

#### **Reporting format**

Reporting will be developed to provide concise, focussed and easy to digest information to Members. This will be based on dashboard style reporting making more effective use of data, visualisation, benefits tracking and other performance data. The process for reporting will be automated wherever possible with the ambition of enabling access to accurate real-time data whenever required. An example of a possible dashboard report has been included below for illustrative purposes only.

#### Appendix 2 – Proposed project governance framework



#### Portfolio management system

In order to achieve the ambitions set out in regard to reporting, it is imperative that the Corporation invests in a portfolio management system. The system will represent the one source of the truth for project data and provide a comprehensive view of portfolio performance, benefits, risks and investment. Integration with the finance system would also provide the opportunity to streamline process for project forecasting, managing and approving payments, project charging and overall portfolio cashflow reporting.

#### **Risk management**

Risk management is central to effective portfolio, programme and project management. For the first time, we will outline a consistent mandatory approach to risk management that aligns with the Corporate Risk Management Strategy. Risk and assurance will be a central consideration at each Gateway and influence the decision to proceed or to stop projects as appropriate. The EPMO will work with project managers and service based PMOs to establish a holistic corporate-wide view of risk and assurance data held on the portfolio management system. The EPMO will be responsible for maintaining a Corporation Portfolio RAID (risks, assumptions, issues and dependencies log). The output of the RAID, along with intelligence from other assurance activity (such as the programme health checks) will enable the EMPO to provide Members with an assurance assessment for Tier 1 (and by exception Tier 2) projects. This will enable Elected Members visibility of the risk profile across all of the Corporation's activities.

### Benefits management and social value

The definition, monitoring and measurement of benefits is crucial to the development of an effective portfolio management framework that is focussed on enabling the delivery of intended outcomes. Central to this is the development of robust and credible business cases.

A business case provides justification for undertaking a project, programme or portfolio. It evaluates the benefit, cost and risk of alternative options and provides a rationale for the preferred solution. Therefore the business case should be treated as a live document and must be reviewed at each gateway.

#### Social value

Social value is about providing meaningful societal, economic and environmental benefits. The Corporation's project portfolio should deliver added value for the square mile and beyond. These benefits should be identified as part of the business case and measured through the benefits management framework.

#### Measuring the benefits:

Working with colleagues in the Chamberlain's department, a portfolio benefits management framework will be developed to drive greater consistency. This framework will include:

 Benefits eligibility guidance including a consistent approach to how benefits should be categorised, quantified, valued and validated

- A Portfolio-level benefits realisation plan
- Review of the benefits case at Portfolio-level reviews
- Effective arrangements to manage benefits post project/programme closure
- Clear arrangements for benefits tracking and reporting at Portfolio level, i.e., via a Portfolio dashboard;
- Regular and robust post-implementation reviews and feeding lessons learned back into forecasting and the benefits management processes.

### Impact assessment and EDI

The Public Sector Equality Duty (PSED) is set out in the Equality Act 2010 (s.149). This requires public authorities, in the exercise of their functions, to have 'due regard' to the need to:

- eliminate discrimination, harassment and victimisation
- advance equality of opportunity between people who share a protected characteristic and those who do not
- foster good relations between people who share a protected characteristic and those who do not.

Further the Corporation, as a responsible employer, developer and funder, should consider what potential impact its projects could have on local communities including residents, businesses and visitors.

# Supplementary information

#### Supplementary information – Portfolio Board draft terms of reference

#### Purpose:

The Portfolio Board, chaired by the Town Clerk, provides officer-level strategic direction, governance, and oversight to ensure successful project delivery across the Corporation. The Board is accountable to the Operational Property and Projects sub-Committee and supports Members in carrying out their strategic oversight role.

#### **Objectives:**

- a. To support effective corporate overview of the Corporation's project portfolio ensuring alignment of projects with the Corporation's strategic goals and objectives
- b. To monitor and review project progress, including milestones, timelines, budgets, and resource allocation
- c. To identify and manage interdependencies and risks across projects
- d. To provide guidance and support to project teams, including issue resolution and decision-making
- e. To approve the deployment of the Project Manager resource pool
- f. To act as a gateway to Committee reporting project status, risks, and recommendations to relevant Committees
- g. To co-ordinate affordability and financial risk considerations
- h. To recommend issues/projects for escalation to Committee

#### Responsibilities by project tier:

For COMPLEX projects (tier 1)

- i. To provide constructive challenge to SROs and project lead officers and consider whether aims and ambitions are going to be achieved.
- j. To review and recommend for approval by Members, project charter, outline business case, project initiation document and full business case
- k. To receive and scrutinise monthly project dashboards
- I. To provide project highlight reports to Members
- m. To provide initial challenge and scrutiny of amber (with red risks) and red rated projects before escalation to Members
- n. To identify potential solutions and/or required corporate intervention for underperforming projects

For STRATEGIC projects (tier 2)

- o. To scrutinise the outline business case and project initiation document
- p. To review and approve full business cases for projects valued £5m or less
- q. To review and recommend for approval by Members, the full business cases for projects valued above \$5m
- r. To receive chief officer portfolio summaries on a quarterly basis

- s. To monitor project performance by exception (projects rated amber with red risks relating to budget, time, outcomes)
- t. To provide initial challenge and scrutiny of red rated projects before escalation to Members

For ROUTINE projects (tier 3)

- u. To provide peer challenge to the proposed Chief officer portfolio on an annual basis
- v. To receive Chief Officer portfolio summary on a quarterly basis
- w. To provide effective challenge and scrutiny of underperforming tier 3 projects as part of a Chief Officer portfolio view (red rated projects or those rated amber with red risks relating to budget, time, outcomes)

#### Composition and Membership:

The Portfolio Board has collective responsibility for ensuring effective governance of the Corporation's project portfolio and providing assurance to Members regarding the proactive management of risks and organisational capacity and capability to deliver. The table below provides further information regarding specific areas of expertise for each member of the Board.

Role	Officer	Key responsibilities
Chair	Town Clerk	<ul> <li>Chairing meetings including the agenda and ensuring effective communication</li> <li>Taking project decisions of up to £5m</li> </ul>
Finance Lead (Deputy Chair)	Chamberlain	<ul> <li>Providing advice and challenge in regard to finance and affordability considerations</li> <li>Chairing the Finance Assurance sub-Group</li> </ul>
Strategy and Performance Lead	Chief Strategy Officer	<ul> <li>Providing advice and challenge around strategic alignment, risk management and progress reporting</li> </ul>
Construction Delivery Lead	City Surveyor	<ul> <li>Providing advice and challenge in regard to construction project delivery and market</li> <li>Ensuring effective oversight of capital delivery and programme resourcing</li> </ul>
Corporate Effectiveness Lead	Chief Operating Officer	<ul> <li>Providing advice and challenge around people,</li> </ul>

		change and equalities issues
Governance Lead	Assistant Town Clerk and Director of Member Services	<ul> <li>Providing advice and challenge in regard to corporate governance requirements</li> </ul>
Portfolio Management Lead	Project Governance Director	<ul> <li>Providing advice and challenge in regards to project governance and operational project management standards</li> </ul>
Secretariat	Enterprise Portfolio Management Office (EPMO)	<ul> <li>Producing portfolio dashboard reports</li> <li>Undertaking gateway reviews and making recommendations to the Board</li> <li>Carrying out project health checks and reporting findings to the Board</li> <li>Providing advice and challenge to SROS and project managers</li> <li>Servicing the meeting</li> </ul>
Invited members depe	ndent on agenda*:	
Project SROs (tier 1 and 2)Boar		<ul> <li>Providing strategic direction and vision for their respective projects. Ensuring project alignment with organisational objectives.</li> <li>Monitoring and reviewing project progress, including milestones, budgets, and risks.</li> <li>Raising project-related issues and risks to the Portfolio Board for resolution.</li> <li>Providing regular updates on project status and key decisions</li> </ul>
Project Managers		<ul> <li>Providing regular updates on project status and key decisions</li> <li>Raising project-related issues and risks to the Portfolio Board for resolution</li> </ul>

*Attendance will be agreed by the EPMO in advance of the meeting.

Meeting arrangements:

- The Portfolio Board shall meet on a monthly basis
- A minimum of four Board members must be present for a meeting to be deemed quorate
- The Board will be serviced by the EPMO and papers will be circulated at least three working days in advance of the meeting

#### The Finance Assurance Board

The Portfolio Board will establish a Finance Assurance sub-Group chaired by the Chamberlain. This Group will be responsible for:

- Supporting effective corporate overview of the Corporation's most complex/high value projects and interdependencies between them, ensuring they accord with agreed policy priorities, corporate decision making and wider objectives
- Providing constructive challenge and to consider whether project delivery plans represent best value
- Co-ordinating affordability considerations and financial risk considerations, assessing impact on the MTFP and advising on prioritisation in order to ensure financial sustainability
- Recommending issues for deep-dive review by the Corporate Portfolio Board

#### Sub-Group membership:

This Group is designed to be a small focussed group of key officers as set out below.

Role	Officer	Key responsibilities
Chair	Chamberlain	Chairing meetings including the agenda and ensuring effective communication
Deputy Chair	Financial Services Director	<ul> <li>Providing updates on cashflow forecasting</li> </ul>
Strategy and Performance Lead	Chief Strategy Officer	<ul> <li>Providing advice and challenge around strategic alignment, risk management and progress reporting</li> </ul>
Portfolio Management Lead	Project Governance Director	<ul> <li>Providing advice and challenge in regards to project governance and operational project management standards</li> </ul>
Project Leads	SROs of tier 1 (complex) projects	<ul> <li>Providing regular updates on project status and key decisions</li> <li>Raising project-related issues</li> </ul>

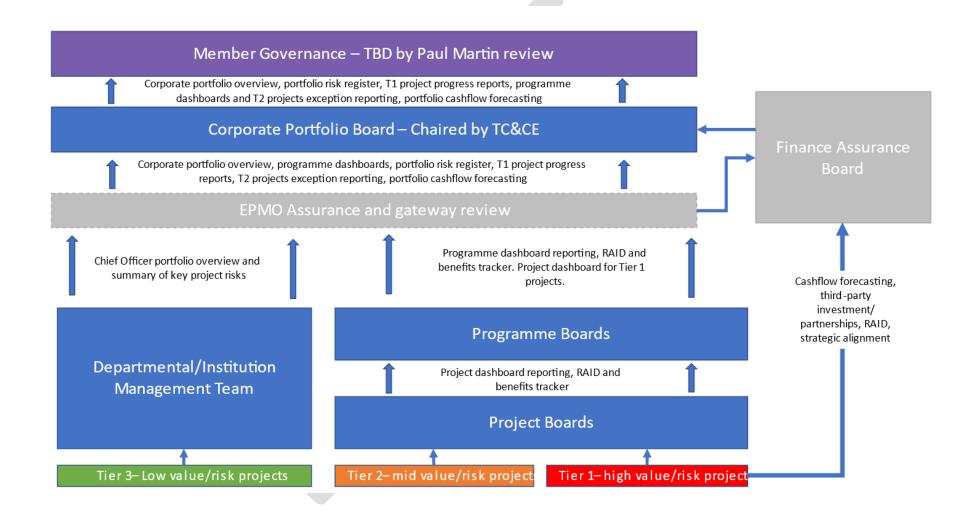
		and risks to the Portfolio Board for resolution
Secretariat	EPMO	<ul> <li>Producing portfolio dashboard reports</li> <li>Servicing the meeting</li> </ul>

Meeting arrangements:

- The Assurance Board will meet on a monthly basis in advance of the Portfolio Board meeting
- The meeting will be serviced by the EPMO
- The EPMO will provide portfolio dashboards in advance of the meeting
- The Financial Services Director will provide a monthly update on cash-flow forecasting

Other papers may be requested

#### Supplementary information – Portfolio Governance map



Supplementary information – SRO agreement document

# The Role of Senior Responsible Owner in the City of London Corporation's strategic and complex projects



### 1. Introduction

Strong leadership and clear accountability are key elements of successful project and programme delivery. Confusion about leadership roles has the potential to create risk in terms of strategic project governance, undermine accountability, and so jeopardise the success of the project/project.

This document

- defines the role and responsibilities of a Senior Responsible Owner (SRO) for the City of London Corporation's strategic and complex projects.
- clarifies the SRO's relationship with other roles, including what each role is accountable for and how they relate to each other.
- sets out the requirements and points to consider when selecting an SRO.

The material is based on the government guidance *The role of the Senior Responsible Owner*, published on 18th July 2019.

### 2. What is accountability?

A key principle for project delivery is that all accountabilities and responsibilities are defined, mutually consistent and traceable across all levels of management:

- the accountable person is the individual who is ultimately answerable for an activity or decision. This includes 'yes' or 'no' authority and veto power. Only one accountable person can be held to account. An accountable person has to be accountable to someone for something. Accountability cannot be delegated or shared.
- the **responsible person** is the individual who actually undertakes the task: in other words, they manage the action / implementation. Responsibility can be shared. The degree of responsibility is determined by the individual with the accountability.

### 3. The role of the Senior Responsible Owner

The Senior Responsible Owner (SRO) is the single officer accountable for the project, ensuring it meets its objectives and realises the expected benefits. SROs of strategic and complex projects are directly accountable to the Sponsoring Committee and will report delivery progress directly to that Committee.

The SRO is the owner of the business case and is accountable for all aspects of governance. The responsibilities of the role include:

- articulating and communicating the vision and business objectives of the project
- ensuring a real business need is being addressed
- assuring ongoing viability, and if necessary taking the decision to recommend stopping the project
- securing the support and input of key external and internal senior stakeholders, including the Project Board
- appointing, chairing and setting priorities for the Project Board
- providing the team with clear leadership, decisions and direction throughout the project's life
- maintaining alignment of the project with the organisation's strategic direction
- ensuring the delivered solution meets the needs of the business
- reporting progress and risks to the sponsoring Committee to ensure effective Member oversight is maintained

#### 3.1 The business case

The Senior Responsible Owner is the owner of the project's business case, is the primary risk owner, and is accountable for ensuring that the project meets its objectives, delivers the required outcomes and realises the required benefits. This not only means monitoring progress on the project, but also the context within which the project will deliver. Sometimes a valid project can become redundant because the reason for its initiation no longer exists or has changed substantially. In this case, the Senior Responsible Owner should consider whether to take the decision to recommend stopping the project.

#### 3.2 Governance and assurance

The Senior Responsible Owner is accountable for ensuring that the project has in place a governance and assurance regime that is effective, proportionate and appropriate. This will enable the project to deliver successfully and allow them to discharge their duties in terms of accountability.

The SRO also chairs the Project Board and is responsible for ensuring the right expertise throughout the life cycle of the project. Whilst the Project Director or project office might recommend how governance is designed for a particular project and put such governance in place, it is the responsibility of the Senior Responsible Owner to ensure that it is effective, proportionate and appropriate.

The SRO ensures the project reports to the sponsoring Committee in a timely fashion.

#### 3.3 Delivery of objectives, outcomes and benefits

The Senior Responsible Owner needs to ensure that the Project Director has defined a project's management and working practices so that they lead to the planned outcomes. In addition, the SRO will need to ensure that project risk is managed throughout the lifecycle by invoking appropriate stage gates, assurance reviews and decision points.

Finally, the Senior Responsible Owner is responsible for ensuring successful transition to live service or operations. This includes delivery of the agreed outcomes and benefits, or ensuring that accountability is transferred to appropriate business ownership, for example through the relevant Chief Officer, to ensure that benefits are realised after the project has closed.

#### 3.4 The SRO's relationship with the Project Director

The Senior Responsible Owner's relationship with the project delivery team is through the Project Director, who is normally appointed by the Senior Responsible Owner. The Project Director is accountable to the Senior Responsible Owner for driving the delivery of the project outcomes within agreed time, cost and quality constraints. The Project Director is responsible for all day-to-day decisions.

The duties of the Project Director include ensuring that:

- the project is appropriately resourced and organised
- the budget requirements are defined and managed within agreed limits
- risks and issues are identified and managed
- there is effective communication with key stakeholders
- effective project controls are in place
- the project team's activities are lawful and ethical
- accurate and timely reporting is carried out.

A Project Director is likely to have several Project Leads or Managers reporting to them, with each being accountable to the Project Director for the day to day management of the project or project assigned to them. The Project Director remains accountable for:

- ensuring all the responsibilities in the project are adequately assigned and undertaken
- maintaining the reporting and relationship with the Senior Responsible Owner
- project risks and issues; deconflicting dependencies between projects

The key to a successful relationship between a Senior Responsible Owner and a Project Director is understanding each other's role and agreeing how they want to work together: The Senior Responsible Owner steers and champions the project, while the Project Director directs it.

It is important that the Senior Responsible Owner allows the Project Director the freedom to manage the project within agreed tolerances while also providing appropriate challenge and support.

The comparison of the roles of the Senior Responsible Owner and Project Director (see Table I) sets out the accountabilities of the Senior Responsible Owner role alongside those typical of the Project Director. This covers the core requirements common across all projects and should be considered a minimum.

# 4. Appointing the SRO

Accountabilities should be assigned on all new projects from an early stage and shall be formalised before the initial investment approval is sought. This process starts with the appointment of the SRO.

Ideally, the Senior Responsible Owner is someone who holds a leadership position with has control or influence over that business area or operating environment into which the project's benefits and outcomes will be delivered. Sometimes it will be necessary to create a new leadership role for an incoming SRO. In this case, it is important to consider the relationship of the role with the wider business area or operating environment.

The decision to appoint an SRO to a new project, or to an existing project following the departure of a previous SRO, should be given careful consideration. Decisions on appointments will be made following CoLC Recruitment procedures.

#### 4.1 Selecting an SRO: things to consider

Having the right leadership is a critical factor in the successful delivery of a project, and the choice of SRO therefore needs careful consideration. When deciding who should be the SRO for a project, particular consideration should be given to the following factors:

- **Position:** The SRO will normally hold a leadership position within the permanent organisation and will have control or influence over the business area or resources into which the project outcomes will be delivered.
- **Capacity**: The SRO must have the necessary time to carry out their responsibilities, taking account of any other responsibilities and commitments they may have.
- **Tenure**: The SRO needs to be able to commit to leading the project through to completion or to an appropriate milestone.
- Knowledge, skills and experience: The SRO may need particular subject matter knowledge (for example in a particular sector or policy domain), or professional skills, depending on the nature of the project. SROs are also expected to have prior experience of project/project delivery and to have completed, or to complete, appropriate development.
- **Personal attributes**: The SRO's key attributes, as defined in Managing Successful Programmes, are to:
  - have appropriate the experience for the responsibilities and accountabilities the role involves
  - be proactive and visible as the driving force behind the project
  - demonstrate strong leadership and decision-making skills
  - foster collaboration across the City of London Corporation to further project outcomes
  - combine realism with openness and the clarity of expression to communicate the project's vision effectively
  - be able to give purpose and direction to the project and take strategic decisions

Appendix 2 – Proposed project governance framework

- focus on delivery of the benefits and achievement of the end goal
- build productive relationships across the project team
- have access to and credibility with key stakeholders

When choosing an SRO, diversity and inclusion, and fair and open competition, should be given full consideration, both in terms of the design of the role and the process through which it is filled.

# Table I: Comparison of the roles of the Senior Responsible Owner and Project Director

	Senior Responsible Owner (SRO)	Project Director
What is the	The Senior Responsible Owner is	The Project Director is accountable to
purpose of	accountable for a project meeting its	the Senior Responsible Owner for
this role?	objectives, delivering the required	establishing the governance framework
	outcomes and realising the required	and for the day-to-day management of
	benefits. The Senior Responsible	a project to deliver the desired
	Owner of a CoLC complex project is	outcomes and outputs and realise the
	accountable to Committee Members.	required benefits. They are responsible
	The Senior Responsible Owner steers	for driving the delivery of the project
	and champions the project.	and overseeing it to ensure that the
		objectives are clearly defined and
		achieved within the agreed time, cost
		and quality constraints. The Project
		Director directs the project.
Typical profile	Should ideally hold a leadership	Should be a project/project delivery
	position within the organisation and	professional with relevant knowledge
	have control or influence over the	and experience of the type and
	business area or resources into which	complexity of project to be delivered.
	the project outcomes will be	Will have proven project leadership
	delivered.	capabilities.
Accountabilitie	s of the role	
Leadership	Provides overall leadership, decisions	Leads and manages the project and the
	and direction.	project team on a day to day basis.
Design	Owns the overall design of the project	Establishes the temporary organisation
	and the temporary organisation	in line with the agreed design.
	needed to deliver it.	
Delivery	Delivers the project objectives and	Creates and leads the project to deliver
	projected outcomes, and realisation	the agreed outcomes within time, cost
	of the benefits set out in the business	and quality constraints.
	case.	
Project	Provides strategic guidance to the	Provides effective leadership and
Management	Project Director and sets key strategic	management controls. Sets project
	delivery parameters.	controls and 'stop / go' decision points.
		Designs the project structure and
		organisation appropriate to the stage
		of the project. Sets appropriate delivery
		methodologies. Manages effective
		transition between project phases.

Business Case	Owns the business case, ensures and	Develops the business case and
Dusiness case	assures ongoing viability. Must refer	supports the SRO in delivering the
	any significant concerns about	business case objectives.
	feasibility, value for money, regularity	
	or propriety to the relevant	
	Committee. Must obtain approval	
	from the Court of Common Council.	
Budget	Secures budget against the business	Develops the budget and delivery
	case throughout the life of the	within budget.
	project.	
Resources	Appoints the Project Director, agrees	Identifies skill requirements for all
	the responsibilities and authority of	stages of the project. Recruits
	the role and secures other resources	resources within budget constraints
	necessary to deliver the project.	and effectively deploys them. Builds
		the project team; delegates roles and
		responsibilities, develops capability and
		fosters innovation.
Stakeholder	Influences and manages the	Ensures stakeholder interests are
Management	environment into which the project	identified and addressed. Manages
	outcomes will be delivered, including	stakeholder communications and
	relationships with key stakeholders,	ensures buy-in. Forms collaborative
	business owners and impacted	relationships with key stakeholders
	parties.	both internally and externally. Works
		collaboratively with the Senior
		Responsible Owner to jointly manage
		senior stakeholders.
Risks & Issues	Manages strategic risks in the	Manages risks and issues and escalates
	operating environment.	to the Senior Responsible Owner where
Courses	Further and the second state	appropriate.
Governance	Ensures appropriate project	Provides all reporting as required by
	governance is in place and chairs the	the Senior Responsible Owner.
	Project Board.	Establishes and manages quality assurance and change control.
Assurance	Ensures appropriate assurance and	Engages on assurance activities and
Assurance	agrees the level and frequency of	reviews, and acts on recommendations.
	assurance reviews.	
Change	Ensures the strategic direction of the	Ensures effective change control is in
Management	project remains aligned with any	place to agree and document changes
	changes in political or business	to project scope and deliverables as
	priorities.	agreed with the Senior Responsible
		Owner and other stakeholders.
Guidance &	Available to the Project Director to	Provides support, guidance and
Support	coach, advise, provide strategic	coaching for the project team.
	direction, assist with conflict	Promotes effective individual and team
	resolution and make timely decisions.	performance.

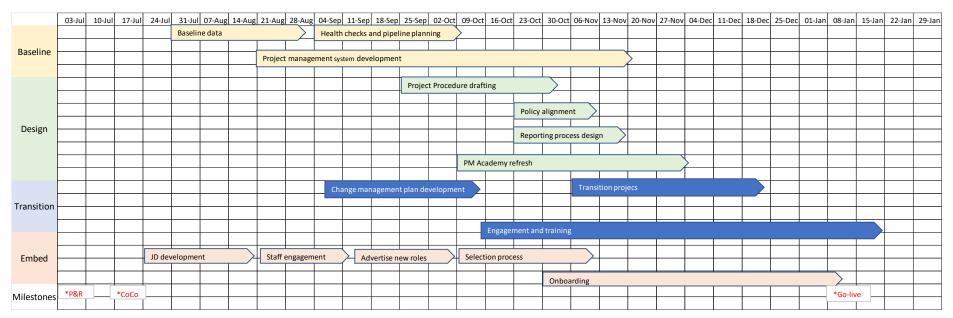
Project	Agrees and owns the project vision	Develops and agrees the vision and
Planning &	and success criteria with the Project	measurable success criteria with the
Control	Director.	Senior Responsible Owner. Develops
		and maintains the project plan and
		integrates with other inter-dependent
		projects/projects. Monitors and
		controls progress and performance,
		and reports regularly to the Senior
		Responsible Owner. Ensures
		appropriate standards, good practice
		and lessons learned are sought and
		applied. Ensures the outcomes /
		transition deliverables are well defined
		and agreed with stakeholders. Manages
		project closure and sign-off.

Page 674

Appendix 2 – Proposed project governance framework

#### APPENDIX 3 - Portfolio management – draft implementation plan

The development of a portfolio management approach is a medium-long term ambition. The aim has been set of reaching the top level of maturity against the government project standard over three years. The implementation plan set out below focusses on activity required in the next 12 months with the first phase of changes due to be implemented by January 2024.



Phase	Phase objectives	Key activity	Timeframe	Resource plan		Investment required
				Lead	Additional	*Total resource costs
					support	included under separate
					required	section below
Phase 1 -	<ul> <li>Establish an</li> </ul>	Complete assessment and tiering	3 weeks	Corporate	1x PMO Analyst	
baselining	accurate view and	of all existing corporate projects		PMO Manager		
		Undertake data cleansing exercise	3 weeks	Corporate	1x PMO Analyst	
		and reconciliation of data held on		PMO Manager		

	<ul> <li>record of project activity</li> <li>Build a robust and credible dataset</li> <li>Develop the IT infrastructure to enable effective</li> </ul>	project system with finance system Upgrade project management system and develop portfolio reporting structure Carry out high-level programme health check of existing major	16 weeks 6 weeks	Corporate PMO Manager Head of Major Programmes	Cora systems implementation support 1x Project Manager	£30,000 upgrade £15,000 - support
	portfolio management • Refine the proposed resource model	programmes Work with ELB to identify business change project pipeline	6 weeks	Head of Transformation & Improvement	None	
		Finalise design of new division and commence recruitment process	8 weeks	Acting Project Governance Director	None	
Phase 2 – detailed design	detailed and effective	Update Project Procedure including process maps and workflows	6 weeks	Acting Project Governance Director	1x Project Manager 1x PMO Analyst	
		Work with stakeholders to align Financial Scheme of Delegation, Procurement Code, Risk Strategy and any other governance document	4 weeks	Acting Project Governance Director	1x Project Manager	
	<ul> <li>Develop core learning and</li> </ul>	Establish Portfolio Board governance	3 weeks	Head of Major Programmes	None	
	development offer	Develop reporting business processes	3 weeks	Head of Major Programmes	1x PMO Analyst	
		Undertake portfolio risk reviews	6 weeks	Acting Project Governance Director	1x Project Manager	
		Review and update Project Management Academy	8 weeks	Corporate PMO Manager	Learning provider and	£20,000 *See below for ongoing costs

				ongoing license	
				costs	
	Design mandatory induction	3 weeks	Head of Major	1x Project	
	module		Programmes	Manager	
	Develop project artefacts and	6 weeks	Corporate	1x Project	
	updated project procedure		PMO	Manager	
			Manager/Head	1x PMO Analyst	
			of Major		
			Programmes		
	Define Head of Profession role		Acting Project	None	
			Governance		
			Director		
	Launch PPM network		Acting Project	None	
			Governance		
			Director		
	Develop change management		People &	None	
	plan		Change Lead		
Phase 3 -	Transition projects to new		Head of	None (within	
transition	structure		Portfolio (new	new structure)	
			role)		
	Rollout training in new approach		Head of	None (within	
			Portfolio	new structure)	
Phase 4 -	Project health checks for all tier 1		Head of	None	
embedding	projects		Portfolio		
	PMA training for tier 1 PMs		Head of	1x Project	
			Portfolio	Manager	
	SRO mandatory training		Head of	None	
			Portfolio		
	Implementation review		Director,	Internal Audit	
			Project and	support	
			Change	required	
			Delivery		
				Sub-total	£65,000

Total reso	ource requirements					
n/a	n/a	Interim PMO analyst	24 weeks	n/a	n/a	£60,000
n/a	n/a	Interim Project Manager	24 weeks	n/a	n/a	£90,000
n/a	n/a	Finance transformation consultant (1 day per week)	12 weeks	n/a	n/a	£10,000
Sub-total						£160,000
GRAND TOTAL					£225,000	

Annual operating budget required:

- Project system: licenses £50,000
- PM Academy delivery £30,000 (for first two years after which we can assess the potential to move to an in-house delivery model)
- APM accreditation £15,000
- Staff training budget £5,000

**Draft for Discussion** 



# **Project Governance review**



Skills and Capabilities 23 January 2023

©RedQuadrant 2022

# The challenge

- The scope
  - A review of organisational capability by undertaking a corporation training needs analysis (building on previous work)
- Deliverable outputs
  - Analysis of current skills identified to create 'as is' picture via skills and capability survey
  - Capability framework descriptions for key PPM roles to support future portfolio TOM
- Deliverable outcome
  - Understanding of organisational capability (PMO ecosystem) to deliver improvement plan including skills analysis.



- A skills and capability survey was run to establish a baseline view of skills and capability within the organisation to inform what would be needed to support a portfolio approach to deliver the City of London improvement plan.
- The survey consisted of 35 questions mostly multiple choice but with some free text boxes to provide both qualitative and quantitative data.
- This was sent to 70+ project and programme managers across the corporation and the institutions.
- 52 people responded which is statistically significant.



# Summary

# Quantitative data showed:

- Gaps in skills and capability for programme management, SRO, Change Mangement and Benefits Management.
- Good skills and capability in Project Management.
- ¹⁰ Staff would welcome further training on programme and project management
- Low maturity of the organisation in terms of a Portfolio delivery approach.

# Qualitative data showed:

- Change control management is elongated and unnecessarily complicated.
- Many projects and programmes are managed on top of the day job, this has the follow impacts:
  - Reduced capacity to do project management well stress and impact on health.
  - Managing multiple stakeholders is a challenge



Proposal

If you wish to move to a more structured portfolio delivery model it is proposed that the gaps in skills and capability are addressed.

To support effective portfolio management, it is important that each role has defined, key responsibilities, technical and behavioural competencies and qualifications.

Consideration would need to be given to how the organisation meets these gaps in the short term as training would need to be front loaded to ensure the right skills and capability are in place to support a successful implementation.

To measure the impact of improving the skills and capability of the portfolio is it proposed that the survey is run again during implementation.



If you wish to move to a structured and comprehensive portfolio model, the following recommendation is key to ensuring the right skills and capability are in place.

- It is recommended that a structured and focused L and D model should be adopted, such as the Project Delivery Capability Framework. This is an excellent tool which describes job roles, capabilities and learning for project delivery professionals across government. It contains four elements:
  - A career pathway/ common set of job roles
  - A set of competencies
  - A signpost for development opportunities specific to job roles
  - The criteria and process to obtain accreditation as a Government Project Delivery Professional.
  - https://assets.publishing.service.gov.uk/government/uploads/system/ uploads/attachment_data/file/1124745/PDCFv3.pdf





# **OUTPUTS FROM THE SURVEY**

Skills and Capability 7

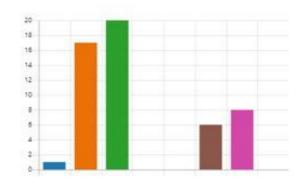
## General

#### Themes

- Most project/programme roles are in Environment and City Surveyors services less in institutions and DCSS.
- Grades of PM's and Programme Managers are mainly E – H
- Most projects and programmes are large and of significant risk to the organisation.

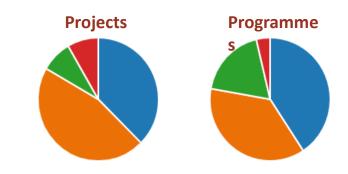
1. Please select the department where your role is based





### Project / programme scale

- It was critical and/or large in c...
- It was significant in terms cost...
- It was desirable to achieve but...
- Local change or development ...



# Key point – High value/high risk projects and programmes need the right framework in place for delivery and oversight



Skills and Capability 8

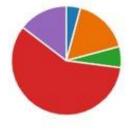
### General cont...



- Most projects and programmes are infrastructure with some cyclical works and procurement activity.
- Service improvement and change accounts for a small proportion.

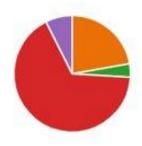






15. What best describes your programme?





Key point – there is some activity that is not true programme or project and should not be considered as part of the portfolio eg procurement



## **Project Management**

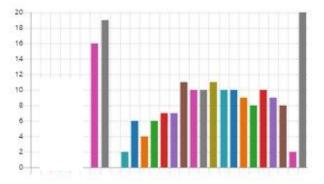
#### Themes

- Most projects sit within the £1mil -£50mil value.
- Most PM's had over 5 years experience.
- Most had a PM qualification





Project management range of training including Prince2 and PM Academy



RedQuadrant

#### Key point – most Project Managers are experienced and well trained

Skills and Capability 10

### **Programme Managment**

#### Themes

- Over half the respondents indicated they supported a programme and were Programme Managers.
- Most had 2 -5 years + experience. Only 5 people are qualified MSP practitioners and 4 to foundation level.
- Programme values sit mostly at the - £1mil - £50 mil value or £100mil or above.

13. What is your length of experience in programme management?



16. Do you have any of the following qualifications?



Key point – Programme management qualification is a gap and therefore a risk as programme value is high.

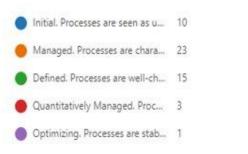


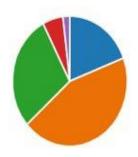
# Portfolio Management

#### Themes

- The organisation had a low maturity in portfolio management. Most responses fell in the initial, managed, defined, level of maturity.
- No evidence of portfolio management qualifications or skills.

25. Which of the statements below best describes the maturity level of the organisation in Portfolio management?



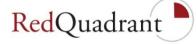


16. Do you have any of the following qualifications?

- Management of Portfolios (M... 0
- Management of Portfolios (M... 0

#### Key point - Portfolio management skills and training is a gap and would be required to support a portfolio delivery approach.





#### Themes

**SRO** 

- Most have never been an SRO
- The SRO is split between being their main role and an additional role
- Most use up to 2 days a week to fulfil the SRO role.
- Nearly all had some programme or project management experience.
- SRO's are particularly difficult to assign for the City Surveyors (*evidence* systems workshop)
- There is a lack of understanding of what is required as an SRO such as: decision making / time impact /need to understand the project or programme. (evidence systems workshop.)
- Some training is provided for SRO's but this does not cover the whole remit of an SRO

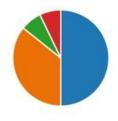
30. Is this work your main job role or in addition to your main role?





32. Which if the following descriptions best describes the project or programme you are SRO for:





Key point – SRO skills training is a gap – this is a risk as most project are high risk and high value

# Change Mangement

#### Themes

- Over half the respondents had not had a role supporting business change.
- Most had limited experience of business change.
- There is an expectation that business change is carried out as part of a project or programme but a lack of understanding as to what this entails. (Evidenced by stakeholder engagement meetingsstage A)

22. Have you ever been in a role facilitating or supporting business change? (If you are unclear on what business change is or how it differs from project and programme management please go directly to next question).



24. What is your length of experience in change management?





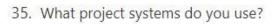
**Red**Ouadra

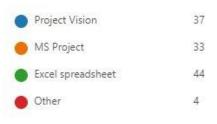
Key point – Change Mangement skills and training are a gap

## Systems

#### Themes

- Project Vision is used by nearly all respondents, but in general only for reporting.
- Other tools and systems used are mainly: MS project and excel spreadsheets.







# Key point – information from the survey to be fed into systems deliverable



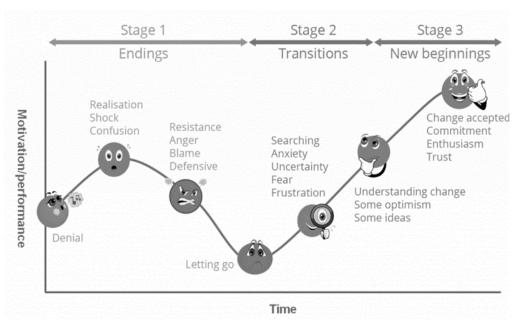
#### **Comments from the survey:**

- Change control management is a point of contention.
- Unhelpful level of gatekeeping
- Lack of knowledge that makes the most rudimentary activity unnecessarily complicated.
- Staff resources have not been sufficiently allocated so I'm not managing my day job or the project well.
- I'm fulfilling management roles beyond my current role in relation to multiple stakeholders capacity issue
- I would be interested in MSP qualification
- I'm keen to do Prince2 when my current project allows time
- I'm always keen to improve my learning



We will employ established Change management methodologies to ensure potential risks are assessed and mitigated before deployment of any changes. These approaches will support the implementation of this programme by engaging directly with those affected by creating an open dialogue and ensuring the purpose and benefits of the change are understood throughout the Corporation.

The impact these changes will have on each stakeholder will be assessed through the change curve (as below). This will be the primary model used to understand and measure how change is being received, and ensure pro-active interventions take place to support each group through the change curve, by listening to their concerns and demonstrating the benefits of the change.



#### **Engagement Strategy**

The following engagement strategy will be utilised to identify key stakeholders; target audience; key messages; communication channels; and those who will deliver the messages.





Where possible, a two-way communication approach (such as open discussions and workshops) will be used to interact with those affected, as it is important that they are able to express any concerns they may have and are afforded the opportunity to ask questions. An 'organisational conversational model' will support deployment and provide a framework for the Programme Team to communicate directly with those affected by the change. Research demonstrates that those prepared for change are more likely to be engaged with the process when this approach is followed. Page 696

Other significant issues that have been identified by officers involved in project delivery include:

 Ambiguity regarding governance in early stages for potential major projects with limited established governance for feasibility and business case development.

#### The Markets Co-location Programme (MCP)

The MCP's initiation phase ran for five years until it was approved as a Major Programme in October 2022. During that period c. £164m was spent on the programme, of which c. £133m was for the acquisition of the Dagenham Dock site and associated expenses.

In 2017, a team was established to produce a Strategic Outline Case and subsequently the Outline Business Case. This team consisted of the Programme Director and three contractors leading on the existing sites, the future market and communications, respectively. The small team needed to work very quickly and flexibly and decisions had to be made fast. There was no clear established governance framework for dealing with this type of large conceptual endeavour. Reports were however submitted to P&R on a regular basis. The success of the early stages of the programme also relied on direct communication with the Chairs of relevant Committees. The programme needed to design its own governance structures for smaller decisions by setting up the MCP Officers' Programme Board, Member-led informal working groups as well as regular updates to respective Chairs.

Since there was no PMO function available, programme management support was initially contracted through external consultants, which did not offer good value for money. From 2019, the programme recruited a dedicated internal programme management resource and was supported by the newly-established Major Programmes Office. Since the MCP business case was approved in October 2022, recruitment has been underway to develop an in-house resource model and the programme has now moved under the remit of the Capital Buildings Board.

 Focus on capital delivery with limited view of wider project outcomes and interdependencies

#### Future Police Estate Portfolio (FPEP)

The FPEP is comprised of six construction projects that will constitute the future police estate. This includes the new Police HQ at the Salisbury Square Development as well as several CoLP enabling workstreams and projects, with numerous interdependencies between them. The interdependencies cover budget, resource, risks, timelines and scheduling as well as scope and change request management.

Formerly the portfolio has been managed without taking a strategic portfolio-wide approach ad it has been recognised that this has at times resulted in the programmes/projects/workstreams being managed independently of each other, without full appreciation of the dependencies the constituent parts of the portfolio have on each other. However, the Commissioner and City Surveyor have been working over the past year to establish a portfolio approach at officer level. However, it is important that corporate governance also develops to take a more strategic portfolio management approach.

• Concerns regarding resourcing of projects, insufficient capacity included as part of project initiation process.

A recurring issue that has arisen during conversations with both officers and Members, is the insufficient assessment of required capacity as part of the project initiation process including, not only, dedicated project delivery resources but capacity required from key corporate services such as finance, procurement and legal services. A strengthened focus on business case development will help to address this issue.

### Agenda Item 21

By virtue of paragraph(s) 3 of Part 1 of Schedule 12A of the Local Government Act 1972.

### Agenda Item 22

By virtue of paragraph(s) 3 of Part 1 of Schedule 12A of the Local Government Act 1972.

### Agenda Item 23

By virtue of paragraph(s) 3 of Part 1 of Schedule 12A of the Local Government Act 1972.

By virtue of paragraph(s) 3 of Part 1 of Schedule 12A of the Local Government Act 1972.

By virtue of paragraph(s) 3 of Part 1 of Schedule 12A of the Local Government Act 1972.

By virtue of paragraph(s) 3 of Part 1 of Schedule 12A of the Local Government Act 1972.

### Agenda Item 24

By virtue of paragraph(s) 3 of Part 1 of Schedule 12A of the Local Government Act 1972.

### Agenda Item 25

By virtue of paragraph(s) 3 of Part 1 of Schedule 12A of the Local Government Act 1972.

By virtue of paragraph(s) 3 of Part 1 of Schedule 12A of the Local Government Act 1972.

By virtue of paragraph(s) 3 of Part 1 of Schedule 12A of the Local Government Act 1972.

By virtue of paragraph(s) 3 of Part 1 of Schedule 12A of the Local Government Act 1972.

## Agenda Item 26

By virtue of paragraph(s) 3 of Part 1 of Schedule 12A of the Local Government Act 1972.

## Agenda Item 27

By virtue of paragraph(s) 3 of Part 1 of Schedule 12A of the Local Government Act 1972.

## Agenda Item 28

By virtue of paragraph(s) 3 of Part 1 of Schedule 12A of the Local Government Act 1972.