



Environmental Statement Addendum and Non-Technical Summary Addendum

Stoney Wood Quarter

July 2026



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INTRODUCTION

1.1.1 This document is an Addendum to the Environmental Statement (ES), which was submitted in support of a detailed Planning Application (ref. 25/2743/FUL) for the redevelopment of Stoney Wood Quarter, The Fairway, London, NW7 3HJ.

1.1.2 The Addendum is submitted as 'Further Information' under Regulation 25 of the Environmental Impact Assessment (EIA) Regulations 2017 (hereafter referred to as the 'EIA Regulations'). The Further Information seeks to respond to statutory consultee comments received from the Greater London Authority (GLA) and the London Borough of Barnet and considers any potential environmental implications of the minor design changes to the planning drawings.

1.2 Context

1.2.1 In November 2025 an ES, prepared by hgh consulting, was submitted to the LBB, in support of an application for detailed planning permission on behalf of Stoney Wood Property Developments Ltd ('the Applicant'). The application is for a residential development on land which is known as Stoney Wood Quarter, The Fairway, London NW7 3HJ ('the Project Site'), and seeks planning permission for:

1.1.1. "Redevelopment of the site for residential use (Class C3), in buildings up to ground plus 5 storeys with ancillary flexible commercial spaces (Use Class E) uses at ground floor level. Together with plant, play space, car and cycle parking, hard and soft landscaping and all other works associated with the development."

1.2.2 It should be noted that following the validation of the planning application the formal description of development was changed to the wording below. This is purely an administrative point.

1.1.2. "Redevelopment of the site to provide new buildings up to six stories in height, comprising up to 463 residential units (Use Class C3), with ancillary flexible amenity and commercial facilities (Use Class E), along with hard and soft landscaping, new public squares and playspace and associated residential amenity, car and cycle parking, waste and recycling storage, plant and other infrastructure."

1.2.3 On 16 March 2026, LBB, acting under delegated authority, decided that it was minded to refuse the application, and notified the Mayor of London of that decision on 18 March 2026 under Article 5 of the 2008 Order.

1.2.4 Following this resolution on 30 March 2026 the Mayor of London issued a direction under Article 7 of the 2008 Order (in exercise of his powers under Section 2A of the Town and Country Planning Act 1990) that he would act as the local planning authority for the purpose of determining the application. , Following this direction the Case Officer at the GLA requested a number of clarifications and further information in relation to the application in relation to the design and the technical assessments.

1.2.5 This Addendum to the ES sets out the design changes and provides clarifications in relation to matters raised by the Case Officer at the GLA that are relevant to the ES.

1.3 Amendments to the Planning Application

1.3.1 Following the consultation, and as a result of RIBA Stage 4 detailed design development a number of minor changes are proposed to the following:

(a) Planning Drawings (Elevations)

(b) Planning Drawings (Block Plans)

The elevations have been developed as a result of the detailed design being evolved as part of RIBA Stage 4. Given the simultaneous finalisation of planning, via the GLA Stage 3 process, and the detailed design being developed to enable an imminent start on site these are submitted for approval now to enable works to commence immediately once planning is resolved.

The Block Plans have evolved in tandem with the elevations.

A full suite of planning drawings have been updated.

(c) Cycle Parking

There will be a reduction in the number of cycle spaces from 856 to 578.

(d) Class E Floorspace

Changes to the non-residential (Use Class E) floorspace

1.3.2 The amendments will be detailed in Section 3.

1.3.3 The description of the development has changed at the request of LBB to:

'Redevelopment of the site to provide new buildings up to six stories in height, comprising up to 463 residential units (Use Class C3), with ancillary flexible amenity and commercial facilities (Use Class E), along with hard and soft landscaping, new public squares and playspace and associated residential amenity, car and cycle parking, waste and recycling storage, plant and other infrastructure.'

1.3.4 The maximum quantum of residential development remains unchanged. The open space, public real and private amenity remains unchanged. The schedule of residential accommodation remains unchanged.

1.4 Structure of this Report

1.4.1 This ES Addendum is set out in a structured manner to allow for easier navigation.

- Section 2 details the amendments to the Project and Further Information;
- Section 3 updates the cumulative development, and
- Section 4 provides a Non-Technical Summary Addendum

1.4.2 A series of Technical Notes are appended to this ES Addendum and are referenced throughout Section 2.

1.4.3 Table 1.1 below sets out which ES appendices are superseded by revised appendices along with new appendices to be read alongside the original appendices.

November 2025 Appendix Reference	Appendix Name	Superseded by

Appendix 2.4	Energy and Sustainability Strategy	Appendix 2.4R
Appendix 2.5	Whole Life Carbon	Appendix 2.5R
Appendix 2.6	Circular Economy	Appendix 2.6R

1.4.4 An Addendum to the Townscape and Visual Assessment (Appendix 2.3 of the November 2025 ES) has been produced and is submitted with the ES Addendum (see TVIA Addendum).

1.4.5 In support of this ES Addendum a series of Technical Notes have been produced to provide clarifications and further information. See below table.

Technical Notes	
Daylight and Sunlight	Appendix A of this ES Addendum
Ecology	Appendix B of this ES Addendum
Green Infrastructure	Appendix C of this ES Addendum
Air Quality	Appendix D of this ES Addendum
Air Quality Positive	Appendix E of this ES Addendum
Noise	Appendix F of this ES Addendum
Drainage and SUDS	Appendix G of this ES Addendum

1.4.6 In addition to the above the following stand-alone planning application documents have been submitted:

- (e) Design and Access Statement Addendum,
- (f) Planning Statement Addendum;
- (g) Transport Assessment Addendum;
- (h) Landscape Strategy; and
- (i) Operational Waste Management Plan.

2.0 AMENDMENTS TO THE PROJECT AND FURTHER INFORMATION

2.1 Design Changes

Drawings and Elevations

- 2.1.1 In order to address comments from the GLA, in relation to the perceived impact onto the existing residential properties to the west of the Project Site, namely 17-20 Fairway Court, minor alterations have been made to Block A, whereby the roof profile has been amended to reduce the roof pitch.
- 2.1.2 As part of RIBA Stage 4 detailed design the elevations and block plans have also evolved and are attached.

Non-Residential Floorspace

- 2.1.3 The overall amount of non-residential floorspace has been amended. See below for a comparison.

Uses	November 2025 ES	Amended Design
Gym (Class E)	142 sqm	240 sqm
Café (Class E)	83 sqm	93 sqm
Soft play (Class E)	-	166 sqm
Co-working (Class E)	176 sqm	207 sqm
Community (Ancillary Class C3)	-	93 sqm
Residents lounge (Ancillary Class CE)	132 sqm	132 sqm
Concierge (Ancillary Class C3)	64 sqm	64 sqm
Total	597sqm	995qm

Cycle Parking

- 2.1.4 The cycle parking is being reduced from a total of 856 spaces to 579 spaces, in line with the Support for Housebuilding London Plan Guidance (March 2026).

2.2 Further Technical Information

Daylight and Sunlight

- 2.2.1 A further assessment has been undertaken to address the reprofiling of the roof of Block A. This can be found at Daylight and Sunlight Technical Note, see Appendix A of this ES Addendum).
- 2.2.2 The Daylight and Sunlight Technical Note (see Appendix A) demonstrates that as a result of the reprofiling improved results were demonstrated for the windows within 17-20 Fairway Court.

2.2.3 These results demonstrate that all ground floor windows continue to experience no worse than negligible changes in daylight with the Project in place following the minor alterations to Block A. Furthermore, all first-floor windows retain more daylight with the revised Project in place compared to the previous results.

2.2.4 In terms of first floor windows, the Daylight and Sunlight Technical Note finds that all first floor windows would retain in excess of 27% VSC (i.e. the target value in the BRE Guidelines at which point it is considered that a window is provided with sufficient daylight) with the Project in place were it not for the overhanging eaves which have a significant effect when the eaves are in situ. Furthermore, all windows are shown to experience no worse than minor adverse impacts to daylight in relative terms; the daylight impact to the property as a whole therefore remains as considered in the ES Chapter i.e. minor adverse and not significant.

Ecology and Trees

2.2.5 The GLA requested a number of clarifications on the Arboricultural Report and Ecology:

- Clarification on tree retention and removal plan;
- Capital Asset Value for Amenity Trees (CAVAT) assessment of the trees proposed for removal;
- Aerial inspection of trees T1 and T2 to determine presence or likely absence of Potential Roost Features (PRFs);
- Ground level tree assessment of the trees in the west of the woodlands;
- Detailed badger mitigation strategy, and
- Updated reptile surveys and mitigation strategy (as required).

2.2.6 It should be noted that the Arboricultural Report was not appended to the November 2025 ES. However, for completeness an Ecology Technical Note and Green Infrastructure Technical Notes has been produced and can be found at Appendix B and Appendix C of this ES Addendum.

CAVAT

2.2.7 A CAVAT assessment has been undertaken using the 'Quick Method'. It is considered that a full tree-by-tree CAVAT assessment would be likely to produce an artificial and potentially misleading valuation. It would require each tree to be treated as a separate public amenity asset, when the actual value of the tree population arises from its collective woodland function. This is particularly relevant where many of the affected trees are lower-category trees, self-set trees, edge trees or trees forming part of woodland canopy structure rather than individually prominent public trees.

2.2.8 The CAVAT Quick Method Assessment is based on the of trees identified for removal as part of the Project.

2.2.9 The purpose of the CAVAT assessment is to provide an objective indication of the public amenity value of trees affected by the Project. The valuation is intended to inform the planning balance by assisting decision-makers in understanding the scale of tree-related impact arising from the proposal.

- 2.2.10 It is therefore not considered to be an environmental assessment as such it is not appended to the ES. The CAVAT Quick Method Assessment is submitted as an Appendix to the Green Infrastructure Technical Note (see Appendix C of this ES Addendum).

Bat Roost Potential

- 2.2.11 An assessment of trees identified as T1 and T2 has been carried out (see Ecology Technical Note, Appendix B of this ES Addendum). The assessment together with all other trees identified in the Preliminary Ecological Appraisal (PEA) within the small wooded area as having potential to support roosting bats. This has included the ivy-clad trees in the western woodland, where dense ivy can conceal cracks, cavities and splits that may constitute potential roost features. The ecologist has confirmed that all of the trees flagged in the PEA within the small wooded area, including trees T1 and T2, have been assessed.
- 2.2.12 The assessment has found no active bat roosts. Of the six Potential Roost Features (PRFs) recorded on the tree previously categorised as moderate (PRF-M), four have been downgraded to low (PRF-L) following inspection.
- 2.2.13 It is anticipated that a planning condition will secure a the proposed dark corridor and to ensure that during construction sensitive working practices will be employed to mitigate any residual risk associated with the PRF-M features.

Detailed Badger Mitigation Strategy

- 2.2.14 A detailed Badger Mitigation Strategy is set out at Technical Note Ecology and Trees (see Appendix B). The aim of the strategy is to ensure that badgers are not excluded from the existing sett without suitable replacement provision. The artificial sett will therefore be created in advance of closure of the existing sett, outside the 30m disturbance zone, and in a location that maintains ecological connectivity to existing foraging routes and habitat.
- 2.2.15 The existing sett will only be closed or destroyed once a qualified ecologist is satisfied, in accordance with licence, that the badgers have been excluded and the sett is no longer occupied. Post closure monitoring of the sett will continue throughout the enabling and construction works.

Updated reptile surveys and mitigation strategy

- 2.2.16 A reptile survey has identified the presence of reptiles on site therefore a planning condition is to secure a Reptile Mitigation Strategy is anticipated, which will mitigate the impact to the reptile population. Prior to site operation works reptiles will be removed from the areas in which they are present prior to works commencing in those areas.
- 2.2.17 A full report setting out the mitigation strategy will be provided once the on-site survey works have concluded, and the final mitigation approach will be confirmed at that stage.
- 2.2.18 It is not anticipated that the conclusions of the ES will change in respect of reptiles. No significant impacts on the reptile population are anticipated.

Air Quality

- 2.2.19 The GLA requested a number of clarifications in relation to the Air Quality Assessment, including the request for an Air Quality Positive Statement. The clarifications are set out within Air Quality Technical Note (Appendix C).
- 2.2.20 The Air Quality Positive Statement can be found at Appendix D.
- 2.2.21 The clarifications do not change the findings of the November 2025 ES.

Noise

- 2.2.22 The Environmental Health Officer (EHO) at LBB requested a number of clarifications in relation to the noise survey. These are set out within a Noise Technical Note (see Appendix E).
- 2.2.23 The EHO queried the noise survey data location in relation to the nearest point to the M1 having only short-term data measurements. The Technical Note (see Appendix E), seeks to demonstrate that the short-term survey for this location was intentional, this location comprised an open and easily accessible location adjacent to the western boundary of the site and that it was not used in isolation to the assessment. Continuous long-term unattended monitoring was also undertaken.
- 2.2.24 The EHO also requested additional noise measurements to be taken at the boundary to the west of the site.
- 2.2.25 However, as explained within the Noise Technical Note (see Appendix E), the assessment as undertaken already incorporates long-term unattended monitoring and the attended measurement at Position A was not intended to represent the full temporal variation at the site in isolation. This is detailed within the Technical Note.
- 2.2.26 As such it is considered that the information presented within the November 2025 ES, along with the clarification presented within the Noise Technical Note provides a robust assessment.

Waste

- 2.2.27 The November 2025 ES stated that operational waste would be managed by the LBB standard service. Waste was not within the Scope of the EIA.
- 2.2.28 A detailed Operational Waste Management Plan (OWMP) has since been produced and is submitted as a stand alone planning document. The original waste strategy was detailed in the Design and Access Statement and proposed the use of an Iceberg underground bin system as the preferred storage solution, but it did not clarify that the containers need to be collected by a specialist collection vehicle.
- 2.2.29 Following the submission of the planning application, the Waste team at LBB were consulted on the application and the waste strategy. The team have confirmed that the Iceberg collection is not compatible with their standard waste collection within the borough.
- 2.2.30 As such and set out in the OWMP, a private specialist will collect the waste and deal with the onward transfer and disposal arrangements. This will form part of the overall management and it is anticipated

that a suitably worded planning condition will be attached to the planning permission to secure the private collection of the operational waste.

Drainage and SUDS

- 2.2.31 In response to clarification sought by the GLA and LBB as the Lead Local Flood Authority (LLFA), updated drainage information has been produced and can be found within a Drainage and Flood Technical Note, see Appendix G of this ES Addendum.
- 2.2.32 The Technical Note provides clarification in relation to runoff rates (greenfield equivalent as far as reasonable practicable); attenuation (via blue roofs and permeable paving and attenuation storage); SUDS (via attenuation and green roofs); climate change allowance (3.3%); watercourse connectivity (via Dean's Brook), and Finished Floor Levels.
- 2.2.33 The findings of the November 2025 ES remain unchanged.

Energy and Sustainability

- 2.2.34 The Energy and Sustainability Strategy, Whole Life Carbon and Circular Economy Assessment have been updated to response to technical clarifications from the GLA. However, the overarching strategy remains unchanged.

3.0 CUMULATIVE DEVELOPMENT

- 3.1.1 Table 2.5 of the November ES lists the potentially cumulative schemes that have been considered, with a corresponding map at Table 2.5.
- 3.1.2 No new cumulative developments have been identified.

4.0 NON-TECHNICAL SUMMARY

- 4.1.1 This section is an Addendum to the Non-Technical Summary (NTS) of the Environmental Statement which was submitted in support of the detailed planning application (ref. 25/2743/FUL) for the redevelopment of Stoney Wood Quarter, The Fairway, London, NW7 3HJ.
- 4.1.2 In November 2025 an ES, prepared by hgh consulting, was submitted to the London Borough Barnet, in support of an application which seeks planning permission for:
- 1.1.3. “Redevelopment of the site for residential use (Class C3), in buildings up to ground plus 5 storeys with ancillary flexible commercial spaces (Use Class E) uses at ground floor level. Together with plant, play space, car and cycle parking, hard and soft landscaping and all other works associated with the development.”
- 4.1.3 It should be noted that following the validation of the planning application the formal description of development was changed to the wording below. This is purely an administrative point.
- 1.1.4. “Redevelopment of the site to provide new buildings up to six stories in height, comprising up to 463 residential units (Use Class C3), with ancillary flexible amenity and commercial facilities (Use Class E), along with hard and soft landscaping, new public squares and playspace and associated residential amenity, car and cycle parking, waste and recycling storage, plant and other infrastructure.”
- 4.1.4 On 16 March 2026, LBB, acting under delegated authority, decided that it was minded to refuse the application, and notified the Mayor of London of that decision on 18 March 2026 under Article 5 of the 2008 Order.
- 4.1.5 Following this resolution on 30 March 2026 the Mayor of London issued a direction under Article 7 of the 2008 Order (in exercise of his powers under Section 2A of the Town and Country Planning Act 1990) that he would act as the local planning authority for the purpose of determining the application. , Following this direction the Case Officer at the GLA requested a number of clarifications and further information in relation to the application in relation to the design and the technical assessments.
- 4.1.6 An Addendum to the ES has been prepared which sets out the design changes and provides clarifications in relation to matters raised by the Case Officer at the GLA that are relevant to the ES.
- 4.1.7 With the exception of the non-residential floorspace and the cycle parking provision the information contained within the Non-Technical Summary remains the same as reported within the November 2025 ES and NTS.
- 4.1.8 A series of Addendums to Technical Appendices of the November 2025 ES have been made, including an Addendum to the to the Townscape and Visual Impact Assessment (TVIA), these are as follows:

November 2025 Appendix Reference	Appendix Name	Superseded by
Appendix 2.4	Energy and Sustainability Strategy	Appendix 2.4R
Appendix 2.5	Whole Life Carbon	Appendix 2.5R
Appendix 2.6	Circular Economy	Appendix 2.6R

4.1.9 Additionally, a series of Technical Notes have been submitted in support of the ES Addendum, including:

Technical Notes	
Daylight and Sunlight	Appendix A of this ES Addendum
Ecology	Appendix B of this ES Addendum
Green Infrastructure	Appendix C of this ES Addendum
Air Quality	Appendix D of this ES Addendum
Air Quality Positive	Appendix E of this ES Addendum
Noise	Appendix F of this ES Addendum
Drainage and SUDS	Appendix G of this ES Addendum

Drawings and Elevations

4.1.10 In order to address comments from the GLA, in relation to the perceived impact onto the existing residential properties to the west of the Project Site, namely 17-20 Fairway Court, minor alterations have been made to Block A, whereby the roof profile has been amended to reduce the roof pitch.

4.1.11 As part of RIBA Stage 4 detailed design the elevations and block plans have also evolved and are attached.

Non-Residential Floorspace

4.1.12 The overall amount of non-residential floorspace has been amended. See below for a comparison.

Uses	November 2025 ES	Amended Design
Gym (Class E)	142 sqm	240 sqm
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Concierge (Ancillary Class C3)	64 sqm	64 sqm
Total	597sqm	995qm

Cycle Parking

4.1.13 The cycle parking is being reduced from a total of 856 spaces to 579 spaces, in line with the Support for Housebuilding London Plan Guidance (March 2026).

Technical Information

4.1.14 The environmental assessment conclusions of the November 2025 ES remain unchanged, as does the environmental information contained within the November 2025 ES NTS.



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IRVINEERING

ENERGY, SUSTAINABILITY & OVERHEATING STATEMENT

STONEY WOOD QUARTER, THE FAIRWAY, NW7 3HS

ASSESSMENT INFORMATION

Prepared by:
Ondrej Gajdos

Date:
10 July 2026

Revision:
J

DISCLAIMER

The findings, conclusions and recommendations of this report are based on the information supplied. Stoney Wood Property Developments Ltd disclaims responsibility in respect of incorrect information imparted to them or for the actual performance of any of the building services installations.

This report is prepared for the use of Stoney Wood Property Developments Ltd, a duty of care is not owed to other parties.

ENERGY & SUSTAINABILITY STATEMENT

STONEY WOOD QUARTER, THE FAIRWAY, NW7 3HS

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Appendices: SAP DER and TER worksheets, BRUKL reports, GLA spreadsheet, Sample flat numbering, Heat Pump Sizing Assessment

EXECUTIVE SUMMARY

STONEY WOOD QUARTER, THE FAIRWAY, NW7 3HS

The London Plan approach of “Be lean” – “Be clean” – “Be green”- “Be seen” is fully adopted by implementing:

- Passive measures (low U-values, air permeability, avoidance of thermal bridging by accredited details)
- High efficiency services, i.e., high efficiency ventilation with heat recovery, high efficiency lighting
- Renewable sources: Air source heat pumps, Solar PV

Excluded renewable sources are:

- Solar hot water
- Biomass
- Wind turbines

The proposed development including the residential and non-residential components will achieve:

- 74% overall regulated CO2 reduction against 2021 Part L compliant baseline
- 57% overall regulated CO2 reduction by renewable sources
- 17% overall regulated CO2 reduction by efficiency measures (“Be Lean” stage of the energy hierarchy)

ABOUT THE ENERGY STATEMENT

This Energy Strategy has been prepared by Irvineering Ltd on behalf of Stoney Wood Property Developments Ltd in support of an application for full planning permission for:-

The site address is Stoney Wood Quarter, The Fairway, Barnet, London, NW73HS

It should be read alongside the full suite of reports that have been prepared and submitted, particularly the Design and Access Statement, prepared by London Placemaking, and the Planning Statement, prepared by DP9.

This statement covers possible active and passive measures including renewable energy sources to make this development sustainable and environmentally friendly.

Specific requirements of London Plan on Energy Efficiency and Renewable Energy will be met through a combination of passive design features, energy efficient building services and renewable energy sources. This is to comply fully with the London Plan Policies and ensure

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STONEY WOOD QUARTER, THE FAIRWAY, NW7 3HS

they are following the "Energy Hierarchy". Specific London Plan policies about CO2 reduction and renewable energy will be met by implementation of passive measures, efficient services and renewable sources. This document has been prepared in line with the GLA London Planning Guidance on Energy Assessments (2022).

Baseline and all estimated energy consumptions have been calculated using a SAP 10.2 of sample residential units and SBEM v6.1 assessment of proposed non-residential spaces (café, coworking, gym, club, concierge).

The tables below show a summary of energy requirements for baseline scheme and reduction proposed to be achieved by passive measures, efficient services and on-site renewable energy sources.

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Table 1: Carbon Dioxide Emissions after each stage of the Energy Hierarchy for residential buildings

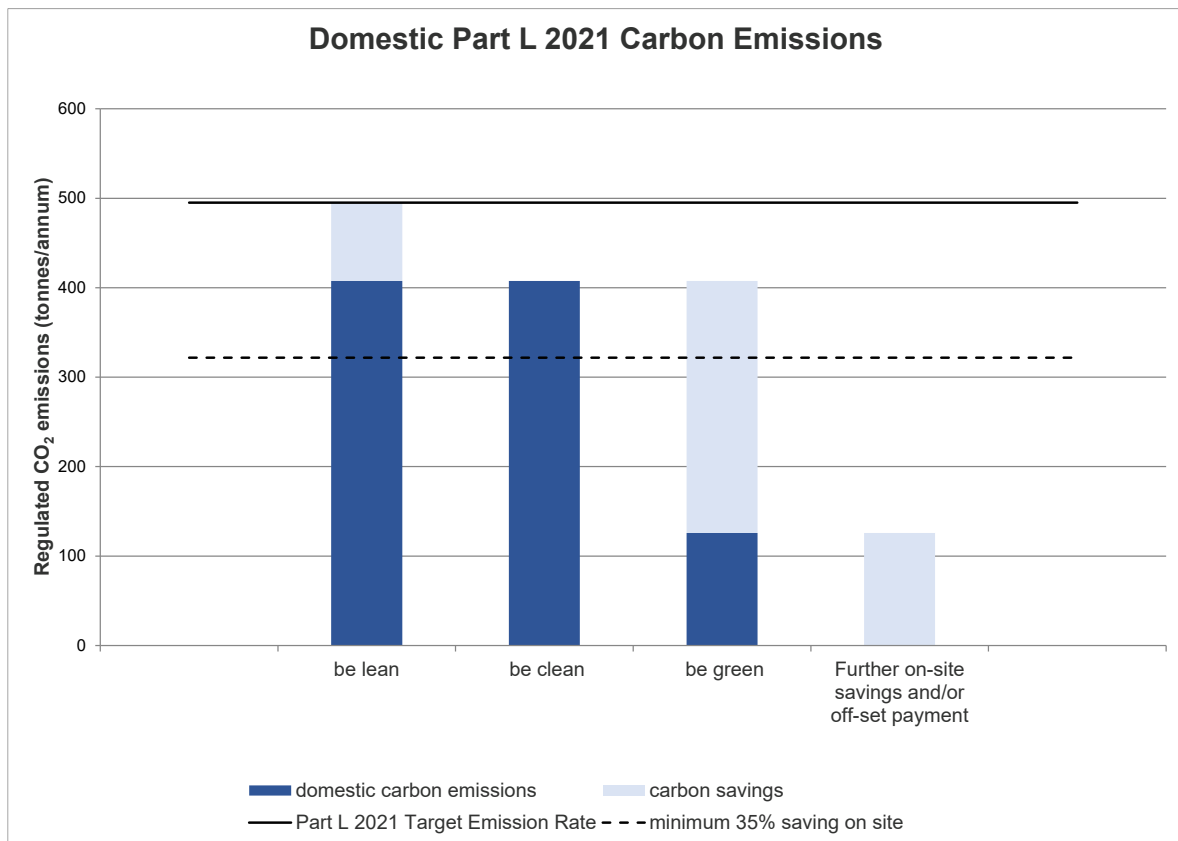
	Carbon Dioxide Emissions for residential buildings (Tonnes CO ₂ per annum)	
	Regulated	Unregulated
Baseline: Part L 2021 of the Building Regulations Compliant Development	495.2	154.2
After energy demand reduction (be lean)	410.0	154.2
After heat network connection (be clean)	410.0	154.2
After renewable energy (be green)	126.5	154.2

Table 2: Regulated Carbon Dioxide savings from each stage of the Energy Hierarchy for residential buildings

	Regulated residential carbon dioxide savings	
	(Tonnes CO ₂ per annum)	(%)
Be lean: savings from energy demand reduction	85.1	17%
Be clean: savings from heat network	0.0	0%
Be green: savings from renewable energy	283.5	57%
Cumulative on site savings	368.7	74%
Annual savings from off-set payment	126.5	-
	(Tonnes CO ₂)	
Cumulative savings for off-set payment	3,796	-
Cash in-lieu contribution (£)	360,603	

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STONEY WOOD QUARTER, THE FAIRWAY, NW7 3HS



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STONEY WOOD QUARTER, THE FAIRWAY, NW7 3HS

Table 3: Carbon Dioxide Emissions after each stage of the Energy Hierarchy for non-residential buildings

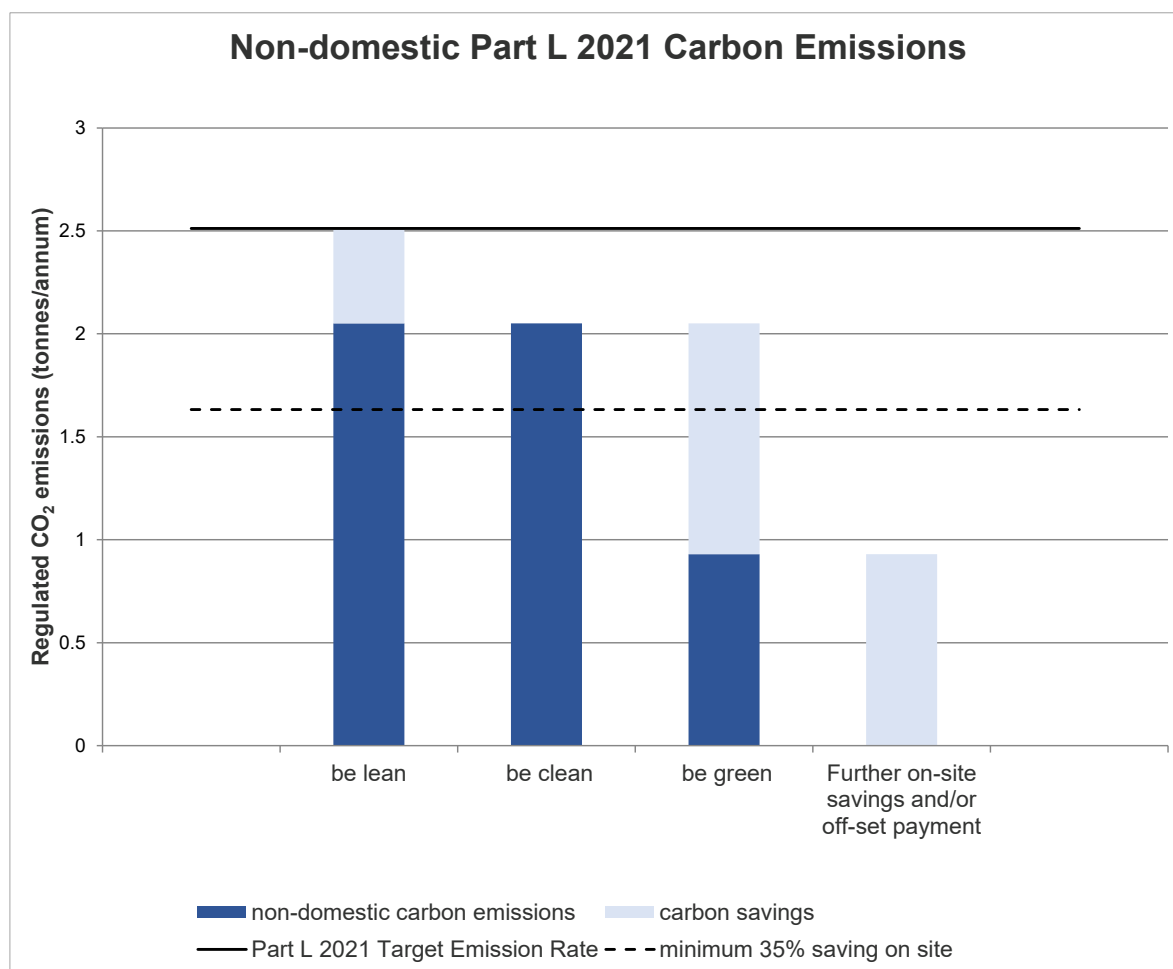
	Carbon Dioxide Emissions for non-residential buildings (Tonnes CO ₂ per annum)	
	Regulated	Unregulated
Baseline: Part L 2021 of the Building Regulations Compliant Development	2.5	4.2
After energy demand reduction (be lean)	2.1	4.2
After heat network connection (be clean)	2.1	4.2
After renewable energy (be green)	0.9	4.2

Table 4: Regulated Carbon Dioxide savings from each stage of the Energy Hierarchy for non-residential buildings

	Regulated non-residential carbon dioxide savings	
	(Tonnes CO ₂ per annum)	(%)
Be lean: savings from energy demand reduction	0.5	18%
Be clean: savings from heat network	0.0	0%
Be green: savings from renewable energy	1.1	44%
Total Cumulative Savings	1.6	62%
Annual savings from off-set payment	0.9	-
	(Tonnes CO ₂)	
Cumulative savings for off-set payment	28	-
Cash in-lieu contribution (£)	2,693	

EXECUTIVE SUMMARY

STONEY WOOD QUARTER, THE FAIRWAY, NW7 3HS



SITE-WIDE

	Total regulated emissions (Tonnes CO ₂ / year)	CO ₂ savings (Tonnes CO ₂ / year)	Percentage savings (%)
Part L 2021 baseline	497.7		
Be lean	412.1	85.6	17%
Be clean	412.1	0.0	0%
Be green	127.5	284.6	57%
Total Savings	-	370.2	74%
	-	CO ₂ savings off-set (Tonnes CO ₂)	-
Off-set	-	3,824.2	-

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STONEY WOOD QUARTER, THE FAIRWAY, NW7 3HS

Table 5: SAP and SBEM calculation specification for each stage of the energy hierarchy

Specification	Notional Baseline	Efficient Baseline (Be Lean)	Proposed Development (Be Green)
Ground floor U-value	0.12	0.10	0.10
External Wall U-value	0.18	0.15	0.15
Wall separating flats or commercial from unheated corridors and stairs U-value	0.18	0.40	0.40
Floor separating flats or commercial from unheated corridors and stairs U-value	0.12	0.10	0.10
Roof U-value	0.13	0.10	0.10
Windows U-value - residential	1.2	0.82 (Velfac In or equivalent)	0.82 (Velfac In or equivalent)
Windows U-value - commercial	1.4	1.3	1.3
External door U-value	1.0	1.0	1.0
Windows g-value - residential	0.63	0.53	0.53
Windows g-value - commercial	0.29	0.20	0.20
Air Permeability	5	3	3
Thermal bridging - residential	Psi-values equivalent to notional dwelling specification Psi-values listed in SAP10.2 table R2;	Psi-values equivalent to notional dwelling specification Psi-values listed in SAP10.2 table R2; Detailed thermal bridging calculations will be required at detailed design stage	Psi-values equivalent to notional dwelling specification Psi-values listed in SAP10.2 table R2; Detailed thermal bridging calculations will be required at detailed design stage
Space Heating System - residential	Gas boiler, SEDBUK efficiency 89.5%, radiators, time and temperature zone control	Gas boiler, SEDBUK efficiency 89.5%, radiators, time and temperature zone control	Communal heat pump SAV DELTA-HP3 or equivalent with SCoP of 3.3, charging linked to use of communal heating; Heat distribution loss factor 1.5 (heat network designed and commissioned in accordance with the CIBSE/ADE 'Heat Networks: Code of Practice for the UK')
Hot water system - residential	Indirect cylinder with 1.4 kWh/day heat loss; waste water heat recovery system with 36% recovery efficiency; showers flow rate 8 l/min	Indirect cylinder with 1.4 kWh/day heat loss; showers flow rate 8 l/min	Communal heat pump monobloc SAV DELTA-HP3 or equivalent with SCoP of 3.3, charging linked to use of communal heating; Distribution network compliant with CIBSE code of practice
Space Heating - non-resi	ASHP VRF with heating SCoP of 2.64,	ASHP with heating SCoP of 2.64;	Communal heat pump monobloc SAV DELTA-HP3 or equivalent with SCoP of 3.3
Hot water - non-resi	ASHP VRF with heating SCoP of 2.86,	ASHP VRF with heating SCoP of 2.86,	Communal heat pump monobloc SAV DELTA-HP3 or equivalent with SCoP of 3.3
Ventilation System - flats	Natural ventilation with intermittent mechanical extracts	MVHR Nuaire MRXBOXAB-Eco5 or equivalent MVHR approved by SAP assessor; Supply and extract duct to and from exterior has to be insulated with 25mm insulation if less than 2m long or 50mm thickness for ducts over 2m long	MVHR Nuaire MRXBOXAB-Eco5 or equivalent MVHR approved by SAP assessor; Supply and extract duct to and from exterior has to be insulated with 25mm insulation if less than 2m long or 50mm thickness for ducts over 2m long
Ventilation System - non-resi	MVHR with SFP 1.0 W/l.s and 80% heat recovery efficiency	MVHR with SFP 0.9 W/l.s and 90% heat recovery efficiency; demand control depending on CO2 sensors	MVHR with SFP 0.9 W/l.s and 90% heat recovery efficiency; demand control depending on CO2 sensors
Lighting - flats	Lighting power 2.3 W/m2; Efficacy of all fixed lighting = 80 lm/W	Lighting power 2.3 W/m2; Efficacy of all fixed lighting = 80 lm/W	Lighting power 2.3 W/m2 or less; Efficacy of all fixed lighting = 80 lm/W or higher
Lighting - non-resi	Luminaire efficacy 100 lm/W, occupancy sensors; constant illuminance photoelectric control; metering with 'out of range' alarm	Luminaire efficacy 120 lm/W, constant illuminance, photoelectric control, occupancy sensors; metering with 'out of range' alarm	Luminaire efficacy 120 lm/W, constant illuminance, photoelectric control, occupancy sensors; metering with 'out of range' alarm
Power factor - non-resi	95	95 (power factor correction device is required)	95 (power factor correction device is required)
Solar Photovoltaic - residential	-	-	100.8 kWp, horizontal panels (less than 15° pitch)
Solar Photovoltaic - non-resi	-	-	10 kWp, horizontal panels (less than 15° pitch)
% Improvement in CO2 over Building regulations compliant baseline	0%	17%	74%

EXECUTIVE SUMMARY

STONEY WOOD QUARTER, THE FAIRWAY, NW7 3HS

Table 6. SAP and SBEM results summary of the proposed development

RESIDENTIAL CO ₂ ANALYSIS (PART L1)																	
				Baseline		'Be Lean'		'Be Green'		Fabric Energy Efficiency (FEE)		Baseline		'Be Lean'		'Be Green'	
Unit identifier (e.g. plot number, dwelling type etc.)	Model total floor area	Number of units	Total area represented by model	TER	Energy saving/generation technologies (-)	DER	DER	Target Fabric Energy Efficiency	Dwelling Fabric Energy Efficiency	Part L 2021 CO ₂ emissions	Energy saving / generation technologies	Part L 2021 CO ₂ emissions	Part L 2021 CO ₂ emissions with Notional PV savings included	'Be Lean' savings	Part L 2021 CO ₂ emissions	'Be Green' savings	
	(m ²)		(m ²)	(kgCO ₂ / m ²)	(kgCO ₂ p.a.)	(kgCO ₂ / m ²)	(kgCO ₂ / m ²)	(kWh/m ²)	(kWh/m ²)	(kgCO ₂ p.a.)	(kgCO ₂ p.a.)	(kgCO ₂ p.a.)	(kgCO ₂ p.a.)	(kgCO ₂ p.a.)	(kgCO ₂ p.a.)	(kgCO ₂ p.a.)	
UNIT 01	79	31	2440	14.66	-84.51	12.48	3.51	40.63	34.79	35,765	-2,610	30,447	27,837	7,928	8,563	19,274	
UNIT 02	82.4	31	2545	14.31	-52.73	12.12	3.45	37.79	34.22	36,414	-1,628	30,841	29,213	7,201	8,779	20,434	
UNIT 03	71.7	31	2214	16.24	-50.27	13.47	3.87	43.40	37.13	35,989	-1,552	29,825	28,273	7,686	8,569	19,704	
UNIT 04	90.1	31	2782	13.55	-126.73	12.12	3.49	39.89	35.33	37,702	-3,914	33,723	29,810	7,893	9,711	20,099	
UNIT 05	73.5	31	2270	15.33	-75.64	12.92	3.62	41.11	34.97	34,796	-2,429	29,326	26,897	7,899	8,217	18,681	
UNIT 06	62.2	31	1921	13.67	-57.08	12.46	3.43	29.17	25.54	26,258	-1,763	23,934	22,171	4,087	6,588	15,582	
UNIT 07	71.7	31	2214	16.34	-50.27	13.57	3.90	43.85	37.79	36,180	-1,552	30,047	28,494	7,686	8,635	19,859	
UNIT 08	91.3	31	2819	12.72	-117.11	11.73	3.38	35.77	35.28	35,864	-3,617	33,073	29,456	6,408	9,530	19,926	
UNIT 09	55	31	1698	13.85	-58.86	13.35	3.68	27.34	27.60	23,524	-1,818	22,675	20,857	2,667	6,250	14,607	
UNIT 10	60.6	31	1871	14.39	-77.77	14.06	3.93	33.36	34.72	26,930	-2,402	26,312	23,911	3,019	7,355	16,556	
UNIT 11	51.6	31	1593	15.00	-55.22	14.22	3.90	31.29	28.08	23,902	-1,705	22,659	20,954	2,948	6,215	14,740	
UNIT 12	53.9	31	1665	16.35	-69.17	15.21	4.31	39.60	35.95	27,215	-2,136	25,317	23,181	4,034	7,174	16,007	
UNIT 13	93.2	31	2878	16.23	-119.54	15.04	4.42	52.66	50.10	46,713	-3,692	43,288	39,596	7,117	12,722	26,875	
UNIT 14	51.6	31	1593	18.05	-55.22	17.08	4.84	45.41	42.72	28,763	-1,705	27,217	25,512	3,251	7,713	17,799	
UNIT 15	72.7	31	2245	17.46	-66.71	16.01	4.68	50.66	49.64	39,199	-2,060	35,944	33,884	5,316	10,507	23,377	
Sum	1,061	463	32,750	15.1	-78.3	13.6	3.9	40.1	36.8	495,184	-34,582	444,628	410,046	85,138	126,527	283,519	
NON-RESIDENTIAL CO ₂ ANALYSIS (PART L2)																	
				Baseline		'Be Lean'		'Be Green'		Baseline		'Be Lean'		'Be Green'			
Building Use	Model Area	Number of units	Total area represented by model	BRUKL TER	BRUKL Displaced electricity (-)	BRUKL BER	BRUKL BER			Part L 2021 CO ₂ emissions	Energy saving / generation technologies	Part L 2021 CO ₂ emissions	Part L 2021 CO ₂ emissions with Notional PV savings included	'Be Lean' savings	Part L 2021 CO ₂ emissions	'Be Green' savings	
	(m ²)		(m ²)	(kgCO ₂ / m ²)	(kWh / m ²)	(kgCO ₂ / m ²)	(kgCO ₂ / m ²)			(kgCO ₂ p.a.)	(kgCO ₂ p.a.)	(kgCO ₂ p.a.)	(kgCO ₂ p.a.)	(kgCO ₂ p.a.)	(kgCO ₂ p.a.)	(kgCO ₂ p.a.)	
Non-resi	456.2	1	456.2	5.51	0.00	4.50	2.07			2,512	0.00	2,050.99	2,051	461	945	1,106	
Sum		1	456	5.5	0.0	4.5	2.1			2,512	0	2,051	2,051	461	945	1,106	
SITE-WIDE ENERGY CONSUMPTION AND CO ₂ ANALYSIS																	
Total Sum			33,206	-	-	-	-			497,696	-34,582	446,679	412,097	85,599	127,472	284,625	

Estimated costs to consumers have been considered to ensure protection from high prices. In line with the energy hierarchy, energy demand reduction has been prioritised. Energy efficiency measures have been the primary factor of consideration before proceeding with a selection of the energy system

Appropriate quality assurance mechanisms and commitments that have been considered as part of the energy strategy and which will be considered during operation include:

- Gaining quality assurance accreditation (e.g. Heat Trust)
- Following quality standards (e.g. CIBSE Code of Practice)
- Transparent billing, including separation of the ongoing maintenance and capital replacement aspects of the standing charge
- Aftercare support (e.g. BREEAM Man 05 Aftercare)
- Heat tariffs options given to occupants
- Consumer choice for metering arrangements at no extra cost (e.g. Prepayment Meters (PPM))

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Table 7. EPC ratings and Energy Cost for sample flats

Plot Reference	SAP Rating	EPC band	Total Annual Energy Costs
UNIT 01	82	B	£386.12
UNIT 02	82	B	£393.50
UNIT 03	81	B	£384.57
UNIT 04	82	B	£424.17
UNIT 05	82	B	£373.59
UNIT 06	82	B	£324.27
UNIT 07	81	B	£386.90
UNIT 08	83	B	£408.51
UNIT 09	82	B	£310.28
UNIT 10	81	B	£338.00
UNIT 11	82	B	£305.15
UNIT 12	81	B	£329.46
UNIT 13	79	C	£500.97
UNIT 14	79	C	£343.47
UNIT 15	79	C	£428.85

INTRODUCTION

STONEY WOOD QUARTER, THE FAIRWAY, NW7 3HS

BACKGROUND

This Energy Strategy has been prepared by Irvineering Ltd on behalf of Stoney Wood Property Developments Ltd in support of an application for full planning permission for:-

Stoney Wood Quarter, The Fairway, Barnet, London, NW73HS

It should be read alongside the full suite of reports that have been prepared and submitted, particularly the Design and Access Statement, prepared by London Placemaking, and the Planning Statement, prepared by DP9.

This statement covers possible active and passive measures including renewable energy sources to make this development sustainable and environmentally friendly.

DESCRIPTION OF THE SITE

Full planning permission is sought for *“Redevelopment of the site for residential use (Class C3), in buildings up to ground plus 5 storeys with ancillary flexible commercial spaces (Use Class E) uses at ground floor level. Together with plant, play space, car and cycle parking, hard and soft landscaping and all other works associated with the development.”*



PLANNING FRAMEWORK

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NATIONAL POLICY

MHCLG sets out basis for local policies in section 14 of National Planning Policy Framework. It requires new development to be planned in ways that can help to reduce greenhouse gas emissions, such as through its location, orientation and design. In Paragraphs 164-165, to help increase the use and supply of renewable and low carbon energy and heat, plans are encouraged to:

- a) provide a positive strategy for energy from these sources, that maximises the potential for suitable development, while ensuring that adverse impacts are addressed satisfactorily (including cumulative landscape and visual impacts);
- b) consider identifying suitable areas for renewable and low carbon energy sources, and supporting infrastructure, where this would help secure their development; and
- c) identify opportunities for development to draw its energy supply from decentralised, renewable or low carbon energy supply systems and for co-locating potential heat customers and suppliers.

THE LONDON PLAN

The London Plan is the name given to the Mayor's spatial development strategy. The current version of London Plan was adopted in March 2021. The aim is to develop London as an exemplary sustainable world city, based on three interwoven themes.

- Strong, diverse long term economic growth
- Social inclusivity to give all Londoners the opportunity to share in London's future success
- Fundamental improvements in London's environment and use of resources.

This energy statement is prepared in line with the London Plan and the latest GLA Energy Assessment Guidance 2022

Specific requirements on development sustainability are set out in the following policies:

POLICY SI 2 MINIMISING CO2 EMISSIONS

- A. Major development should be net zero-carbon. This means reducing greenhouse gas emissions in operation and minimising both annual and peak energy demand in accordance with the following energy hierarchy:

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- 1) be lean: use less energy and manage demand during operation
 - 2) be clean: exploit local energy resources (such as secondary heat) and supply energy efficiently and cleanly
 - 3) be green: maximise opportunities for renewable energy by producing, storing and using renewable energy on-site
 - 4) be seen: monitor, verify and report on energy performance.
- B. Major development proposals should include a detailed energy strategy to demonstrate how the zero-carbon target will be met within the framework of the energy hierarchy.
- C. A minimum on-site reduction of at least 35 per cent beyond Building Regulations 152 is required for major development. Residential development should achieve 10 per cent, and non-residential development should achieve 15 per cent through energy efficiency measures. Where it is clearly demonstrated that the zero-carbon target cannot be fully achieved on-site, any shortfall should be provided, in agreement with the borough, either:
- 1) through a cash in lieu contribution to the borough's carbon offset fund, or
 - 2) off-site provided that an alternative proposal is identified and delivery is certain.
- D. Boroughs must establish and administer a carbon offset fund. Offset fund payments must be ring-fenced to implement projects that deliver carbon reductions. The operation of offset funds should be monitored and reported on annually.

POLICY SI 3 D – ENERGY INFRASTRUCTURE

Major development proposals within Heat Network Priority Areas should have a communal low-temperature heating system:

- 1) the heat source for the communal heating system should be selected in accordance with the following heating hierarchy:
 - a) connect to local existing or planned heat networks
 - b) use zero-emission or local secondary heat sources (in conjunction with heat pump, if required)
 - c) use low-emission combined heat and power (CHP) (only where there is a case for CHP to enable the

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delivery of an area-wide heat network, meet the development's electricity demand and provide demand response to the local electricity network)

- d) use ultra-low NOx gas boilers
- 2) CHP and ultra-low NOx gas boiler communal or district heating systems should be designed to ensure that they meet the requirements in Part B of Policy SI 1 Improving air quality
- 3) where a heat network is planned but not yet in existence the development should be designed to allow for the cost-effective connection at a later date.

POLICY SI 4 – MANAGING HEAT RISK

- A. Development proposals should minimise adverse impacts on the urban heat island through design, layout, orientation, materials and the incorporation of green infrastructure.
- B. Major development proposals should demonstrate through an energy strategy how they will reduce the potential for internal overheating and reliance on air conditioning systems in accordance with the following cooling hierarchy:
 - 1) reduce the amount of heat entering a building through orientation, shading, high albedo materials, fenestration, insulation and the provision of green infrastructure
 - 2) minimise internal heat generation through energy efficient design
 - 3) manage the heat within the building through exposed internal thermal mass and high ceilings
 - 4) provide passive ventilation
 - 5) provide mechanical ventilation
 - 6) provide active cooling systems.

OVERHEATING ASSESSMENT

STONEY WOOD QUARTER, THE FAIRWAY, NW7 3HS

SUMMARY

An overheating analysis has been performed in order to assess performance of the proposed development against CIBSE TM59 defining criteria of thermal comfort, and CIBSE TM49 urban climate projections

A representative sample of 10 No residential units has been modelled. The predicted internal temperature was simulated considering all aspects of occupancy, solar gain and predicted internal heat gains. Specific weather files have been applied to the model to assess the building performance against urban heat island effects and projected future climate conditions.

The calculation results show that the tested residential units fail on the TM59 thermal comfort overheating criteria using the main TM49 weather file (DSY1) for the 'future near extreme summer', which is due to limited window opening dictated by Noise Assessment. A complete series of tests, including 2 additional projected weather files (DSY2 and DSY3), each representing distinct near-extreme summer conditions, have informed the overheating strategy, which includes passive design considerations. Mechanical cooling using hybrid MVHR add-on units is proposed as the final step of the GLA cooling hierarchy.

RESIDENTIAL CRITERIA CIBSE TM59

Compliance is based on passing the following criteria:

For naturally ventilated dwellings:

Criterion 1a: Hours of Exceedance (He):

For living rooms, kitchens and bedrooms:
Same as CIBSE TM52 Criterion 1.

Criterion 1b:

For bedrooms only:
to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26 °C for more than 1% of annual hours. (Note: 1% of the annual hours between 22:00 and 07:00 for bedrooms is 32 hours, so 33 or more hours above 26 °C is recorded as a fail).

For mechanically ventilated dwellings:

all occupied rooms should not exceed an operative temperature of 26 °C for more than 3% of the annual occupied annual hours

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CIBSE TM49 REQUIREMENTS

Overheating is assessed using CIBSE TM49 future weather files to provide a risk-based analysis of the summer performance of a building under the impact of both the local microclimatic Urban Heat Island (UHI) effect, and the macroclimatic effect of an uncertain climate future.

The analysis behind the TM49 requirements has identified a substantial increase in the likelihood of warmer summers in the future, with the more extreme historical summers becoming average summers by the middle of the century. This is the period over which most buildings built today will be in operation. Hence it is recommended to evaluate overheating risk using climate change-adjusted weather data. With reference to the latest climate projections for the UK (UKCP09 projections), the future weather files utilise three years of varying severity of hot events:

DSY1 - 1989: a moderately warm summer. This is the current design summer year for London, with which the scheme should comply to demonstrate resilience to overheating.

DSY2 - 2003: a year with a brief yet extreme heat wave. It is not mandatory for the building to comply: as such this data has been used to evaluate risk and inform the design.

DSY3 - 1976: a year with a prolonged period of sustained warmth. It is not mandatory for the building to comply: as such this data has been used to evaluate risk and inform the design.

DYNAMIC SIMULATIONS

The analysis was carried out using DesignBuilder v6 - EnergyPlus v8 engine. The 3D model is based on the architectural drawings and specifications.

The selected sample of 10 units reflects the full range of unit characteristics present across the scheme, including variations in dwelling size, layout, orientation and exposure. Units were chosen to capture different façade conditions (north-, east-, south- and west-facing), varying levels of solar access, and a spread across ground, mid- and top-floor locations. The sample also includes both single-aspect and dual-aspect dwellings. These ten dwellings provide a proportionate and representative coverage of the development's typologies, ensuring that the dynamic assessment appropriately reflects the thermal performance expected across the wider scheme.

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Modelled flats



INTERNAL DESIGN CONDITIONS

Occupancy and equipment loads in flats are modelled as per CIBSE TM59 Table 2:

OVERHEATING ASSESSMENT

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Unit/ room type	Occupancy	Equipment load
Studio	2 people at all times	Peak load of 450 W from 6 pm to 8 pm*. 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 5% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm 1 person at full gain in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double bed)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only; see section 3.1 above

* All times in GMT

Lighting is modelled as 2 W/m² from 6pm to 11pm.

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GLAZING AND SOLAR SHADING

All windows in houses are modelled without internal blinds, in line with Part O guidance.

g-value of 0.53 is used for all residential glazing

Proposed amount of glazing has been chosen to represent the optimal balance between positive impact of solar gains in winter, natural ventilation through window opening, daylight requirement and overheating prevention.

While reducing the glazed areas would somewhat reduce the solar gains, it would also mean reduced natural ventilation and daylighting and therefore the overheating results would be very similar.

Reduction in glazed areas would therefore not lead to more units complying with TM59 criteria.

Solar shading from external obstacles (balconies / overhangs) is included in the model. Other external shading (external blinds / louvres / fins) are not proposed due to:

- Architectural (visual) reasons
- Installation cost
- Maintenance requirements

VENTILATION

Ventilation strategy for the flats has been chosen in line with London Plan Cooling hierarchy and with energy efficiency impacts in mind. It is proposed to install continuous heat recovery ventilation with summer bypass in all units. The proposed strategy will ensure optimal balance in capital cost, occupant comfort in terms of fresh air and thermal comfort while reducing the cooling requirements.

Limited natural ventilation through openable windows is included in the model. Windows are modelled in line with Noise Impact Assessment as 1-3% openable area as percentage of floor area.

Mechanical ventilation is also modelled in all flats, providing 0.5 air change per hour.

Simulation for a theoretical scenario with fully openable windows has also been modelled, showing compliance with Part O criteria under DSY1 weather data. This proves, that the overheating risks have been effectively mitigated through passive design measures, including effective window sizing solar shading features such as overhangs, appropriate glazing specifications and mechanical ventilation with summer bypass. The only constraint preventing this scenario to be implemented is the external noise.

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Performance against Mechanical ventilation criteria of TM59 (operative temperature of 26 °C for more than 3% of the annual occupied annual hours) has been tested using increased mechanical ventilation rate of 20 l/s.person. This is considered to be the maximum ventilation rate that can be provided by domestic MVHR units. With this ventilation rate, most habitable rooms in the tested apartments still fail under DSY1 weather data, which is a common and expected result observed commonly in other similar schemes in London area.

MECHANICAL COOLING



After applying all of the above measures, it is concluded, that it is not possible to ensure sufficient thermal comfort in majority (68%) of habitable rooms due to limited window opening dictated by noise risk assessment. As the last step in cooling hierarchy it is therefore proposed to install low-energy hybrid cooling systems, which will be add-on units on the MVHR units and will provide cooling through MVHR supply air without needing external condensers. This system will consume significantly less energy than traditional air conditioning systems.

Cooling demand is expected to align closely with periods of peak solar generation—typically during warm, sunny days—when the grid also experiences surplus electricity production. By operating primarily during these peak PV periods, the cooling system will:

- Utilise on-site renewable energy, reducing reliance on grid electricity;
- Coincide with times of national grid overgeneration, helping to absorb excess renewable energy;
- Contribute to grid stability by increasing local daytime demand during solar surpluses.

This integrated approach supports the transition to a low-carbon energy system by aligning building energy consumption patterns with renewable generation profiles, in line with national decarbonisation goals.

Spaces where cooling is required for compliance are highlighted in light blue on page 22.

It should be noted that the cooling module does not provide sufficient cooling to constitute comfort cooling and is aimed at peak looping. Control is on/off determined by room temperature sensor. Output temperature controlled by units internal temperatures and air flows. Performance cannot be modulated, set points are determined at design stage and are not user adjustable. The sole purpose of the system is to mitigate overheating, therefore typically cooling is only intended to be active for the percentage of the year when the internal temperature is predicted to exceed 26°C.

OVERHEATING ASSESSMENT

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OVERHEATING SIMULATION RESULTS – DSY1 – THEORETICAL SCENARIO WITH FULLY OPENABLE WINDOWS

Criteria for predominantly naturally ventilated homes				
Block	Zone	Criterion A (%)	Criterion B (hr)	Pass/Fail
A-00LG	03bed1	0	19.5	Pass
A-00LG	03bed2s	0	15	Pass
A-00LG	03hall	0	N/A	Pass
A-0GF	03kit-din3	0	N/A	Pass
A-1st	03bed3s	0	14.5	Pass
D-1st	05LDK3	0	N/A	Pass
D-1st	05bed1	0	8.5	Pass
D-1st	05bed2s	0	9	Pass
D-1st	05bed3s	0	15	Pass
D-2nd	10LDK2	0	N/A	Pass
D-2nd	10bed1	0	9	Pass
D-2nd	10bed2s	0.45	9	Pass
D-4th	12bed1	1.71	18	Pass
D-4th	12bed2s	1.33	17.5	Pass
D-4th	12kit-din2	2.3	N/A	Pass
D-4th	12liv2	0.58	N/A	Pass
E-1st	08LDK3	0	N/A	Pass
E-2nd	08bed1	0	10	Pass
E-3rd	08bed2s	0.04	12.5	Pass
E-3rd	08bed3s	0.1	11.5	Pass
F-4th	13bed1	0.18	15	Pass
F-4th	13bed2s	0	12.5	Pass
F-4th	13bed3s	0.29	13.5	Pass
F-4th	13bed4s	0	13	Pass
F-4th	13kit-din4	0.2	N/A	Pass
F-4th	13liv4	0	N/A	Pass
G-00LG	02bed1	0.05	20	Pass
G-00LG	02bed2s	0	21.5	Pass
G-00LG	02bed3s	0	17	Pass
G-00LG	02hall	0	N/A	Pass
G-1st	09bed1	0	7.5	Pass
G-1st	09kit-din1	0	N/A	Pass
G-1st	09liv1	0	N/A	Pass
G-3rd	11bed1	0	13	Pass
G-3rd	11bed2s	0	8.5	Pass
G-3rd	11kit-din2	0	N/A	Pass
G-3rd	11liv2	0	N/A	Pass
I00LG	01bed1	0	20.5	Pass
I00LG	01bed2s	0.04	19	Pass
I00LG	01hall	0	N/A	Pass

OVERHEATING ASSESSMENT

STONE WOOD QUARTER, THE FAIRWAY, NW7 3HS

OVERHEATING SIMULATION RESULTS – DSY1 WITH LIMITED WINDOW OPENING

Criteria for predominantly naturally ventilated homes				
Block	Zone	Criterion A (%)	Criterion B (hr)	Pass/Cooling Required
A-00LG	03bed1	0	75	Cooling Required
A-00LG	03bed2s	0	54.5	Cooling Required
A-00LG	03hall	0	N/A	Pass
A-0GF	03kitXdin3	0.03	N/A	Pass
A-1st	03bed3s	0.44	180.5	Cooling Required
D-1st	05LDK3	0.03	N/A	Pass
D-1st	05bed1	0.25	248	Cooling Required
D-1st	05bed2s	0.19	142	Cooling Required
D-1st	05bed3s	0	225	Cooling Required
D-2nd	10LDK2	20.24	N/A	Cooling Required
D-2nd	10bed1	14.36	514.5	Cooling Required
D-2nd	10bed2s	23.81	417	Cooling Required
D-4th	12bed1	45.45	868.5	Cooling Required
D-4th	12bed2s	43.04	807.5	Cooling Required
D-4th	12kitXdin2	59.21	N/A	Cooling Required
D-4th	12liv2	45.17	N/A	Cooling Required
E-1st	08LDK3	0.46	N/A	Pass
E-2nd	08bed1	0.93	128.5	Cooling Required
E-3rd	08bed2s	1.49	162	Cooling Required
E-3rd	08bed3s	2.07	159	Cooling Required
F-4th	13bed1	15.43	438	Cooling Required
F-4th	13bed2s	6.58	405.5	Cooling Required
F-4th	13bed3s	7.88	245.5	Cooling Required
F-4th	13bed4s	4.4	339.5	Cooling Required
F-4th	13kitXdin4	18.93	N/A	Cooling Required
F-4th	13liv4	9.11	N/A	Cooling Required
G-00LG	02bed1	0.08	29.5	Pass
G-00LG	02bed2s	0	30	Pass
G-00LG	02bed3s	0	27	Pass
G-00LG	02hall	0	N/A	Pass
G-1st	09bed1	0.29	220.5	Cooling Required
G-1st	09kitXdin1	0.3	N/A	Pass
G-1st	09liv1	0.4	N/A	Pass
G-3rd	11bed1	91.24	1341	Cooling Required
G-3rd	11bed2s	78.3	1323.5	Cooling Required
G-3rd	11kitXdin2	94.18	N/A	Cooling Required
G-3rd	11liv2	89.73	N/A	Cooling Required
I00LG	01bed1	0	30	Pass
I00LG	01bed2s	0.14	28.5	Pass
I00LG	01hall	0	N/A	Pass

OVERHEATING ASSESSMENT

STONEY WOOD QUARTER, THE FAIRWAY, NW7 3HS

OVERHEATING SIMULATION RESULTS – DSY1 – THEORETICAL SCENARIO WITH INCREASED MECHANICAL VENTILATION 20 L/S.PERSON

Zone	% hours exceeded	Pass / Fail
A-00LG 03BED1	1.77%	Pass
A-00LG 03BED2S	3.48%	Fail
A-0GF 03KIT-DIN3	2.68%	Pass
A-0GF 03LIV3	2.36%	Pass
A-1ST 03BED3S	11.48%	Fail
D-1ST 05BED1	4.11%	Fail
D-1ST 05BED2S	5.57%	Fail
D-1ST 05BED3S	1.87%	Pass
D-1ST 05LDK3	1.73%	Pass
D-2ND 10BED1	4.49%	Fail
D-2ND 10BED2S	28.54%	Fail
D-2ND 10LDK2	12.10%	Fail
D-4TH 12BED1	18.88%	Fail
D-4TH 12BED2S	22.08%	Fail
D-4TH 12KIT-DIN2	18.19%	Fail
D-4TH 12LIV2	9.21%	Fail
E-1ST 08LDK3	13.19%	Fail
E-2ND 08BED1	8.81%	Fail
E-3RD 08BED2S	12.47%	Fail
E-3RD 08BED3S	18.34%	Fail
F-4TH 13BED1	14.49%	Fail
F-4TH 13BED2S	7.92%	Fail
F-4TH 13BED3S	18.68%	Fail
F-4TH 13BED4S	8.41%	Fail
F-4TH 13KIT-DIN4	13.89%	Fail
F-4TH 13LIV4	7.65%	Fail
G-00LG 02BED1	1.74%	Pass
G-00LG 02BED2S	4.27%	Fail
G-00LG 02BED3S	2.39%	Pass
G-0GF 02LDK3	6.30%	Fail
G-1ST 09BED1	2.93%	Pass
G-1ST 09KIT-DIN1	2.89%	Pass
G-1ST 09LIV1	5.77%	Fail
G-3RD 11BED1	5.01%	Fail
G-3RD 11BED2S	4.27%	Fail
G-3RD 11KIT-DIN2	11.15%	Fail
G-3RD 11LIV2	4.97%	Fail
I00LG 01BED1	1.63%	Pass
I00LG 01BED2S	8.09%	Fail
I-0GF 01LDK2	11.00%	Fail

OVERHEATING ASSESSMENT

STONEY WOOD QUARTER, THE FAIRWAY, NW7 3HS

OVERHEATING SIMULATION RESULTS – DSY2 WITH LIMITED WINDOW OPENING

Criteria for predominantly naturally ventilated homes				
Block	Zone	Criterion A (%)	Criterion B (hr)	Pass/Fail
A-00LG	03bed1	0.19	107.5	Fail
A-00LG	03bed2s	0.14	88.5	Fail
A-00LG	03hall	0.28	N/A	Pass
A-0GF	03kitXdin3	0.43	N/A	Pass
A-1st	03bed3s	1.63	176	Fail
D-1st	05LDK3	0.25	N/A	Pass
D-1st	05bed1	0.42	151.5	Fail
D-1st	05bed2s	0.51	131.5	Fail
D-1st	05bed3s	0.11	200	Fail
D-2nd	10LDK2	8.73	N/A	Fail
D-2nd	10bed1	4.58	351	Fail
D-2nd	10bed2s	14.43	274	Fail
D-4th	12bed1	17.8	326.5	Fail
D-4th	12bed2s	18.59	321	Fail
D-4th	12kitXdin2	25.05	N/A	Fail
D-4th	12liv2	17.03	N/A	Fail
E-1st	08LDK3	2.1	N/A	Pass
E-2nd	08bed1	1.77	129.5	Fail
E-3rd	08bed2s	2.63	159.5	Fail
E-3rd	08bed3s	3.5	145.5	Fail
F-4th	13bed1	7.22	215	Fail
F-4th	13bed2s	2.45	240.5	Fail
F-4th	13bed3s	5.15	192	Fail
F-4th	13bed4s	2.23	217.5	Fail
F-4th	13kitXdin4	7.79	N/A	Fail
F-4th	13liv4	4.18	N/A	Fail
G-00LG	02bed1	0.04	44.5	Fail
G-00LG	02bed2s	0.16	46	Fail
G-00LG	02bed3s	0.42	58	Fail
G-00LG	02hall	0.23	N/A	Pass
G-1st	09bed1	0.71	168	Fail
G-1st	09kitXdin1	0.94	N/A	Pass
G-1st	09liv1	1.42	N/A	Pass
G-3rd	11bed1	68.34	1115	Fail
G-3rd	11bed2s	58.13	1093	Fail
G-3rd	11kitXdin2	71.43	N/A	Fail
G-3rd	11liv2	67.03	N/A	Fail
I00LG	01bed1	0.12	44	Fail
I00LG	01bed2s	1.01	62.5	Fail
I00LG	01hall	1.01	N/A	Pass

OVERHEATING ASSESSMENT

STONEY WOOD QUARTER, THE FAIRWAY, NW7 3HS

OVERHEATING SIMULATION RESULTS – DSY3 WITH LIMITED WINDOW OPENING

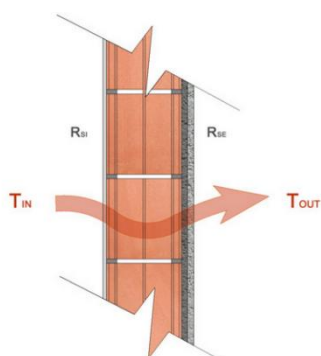
Criteria for predominantly naturally ventilated homes				
Block	Zone	Criterion A (%)	Criterion B (hr)	Pass/Fail
A-00LG	03bed1	0.32	154.5	Fail
A-00LG	03bed2s	0.37	131.5	Fail
A-00LG	03hall	0.28	N/A	Pass
A-0GF	03kitXdin3	1.9	N/A	Pass
A-1st	03bed3s	3.71	244.5	Fail
D-1st	05LDK3	0.76	N/A	Pass
D-1st	05bed1	1.3	240	Fail
D-1st	05bed2s	1.66	213.5	Fail
D-1st	05bed3s	0.59	264	Fail
D-2nd	10LDK2	15.44	N/A	Fail
D-2nd	10bed1	9.11	415	Fail
D-2nd	10bed2s	18.28	373	Fail
D-4th	12bed1	22.16	534	Fail
D-4th	12bed2s	22.6	526.5	Fail
D-4th	12kitXdin2	33.86	N/A	Fail
D-4th	12liv2	23.96	N/A	Fail
E-1st	08LDK3	4.98	N/A	Fail
E-2nd	08bed1	3.85	195	Fail
E-3rd	08bed2s	4.85	223.5	Fail
E-3rd	08bed3s	5.43	212	Fail
F-4th	13bed1	11.79	361.5	Fail
F-4th	13bed2s	6.77	347	Fail
F-4th	13bed3s	9.69	264.5	Fail
F-4th	13bed4s	6.02	306	Fail
F-4th	13kitXdin4	14.98	N/A	Fail
F-4th	13liv4	9.39	N/A	Fail
G-00LG	02bed1	0.14	61	Fail
G-00LG	02bed2s	0.18	88.5	Fail
G-00LG	02bed3s	0.23	93.5	Fail
G-00LG	02hall	0.13	N/A	Pass
G-1st	09bed1	2.88	250	Fail
G-1st	09kitXdin1	3.92	N/A	Fail
G-1st	09liv1	4.96	N/A	Fail
G-3rd	11bed1	78.85	1187	Fail
G-3rd	11bed2s	65.52	1130.5	Fail
G-3rd	11kitXdin2	83.43	N/A	Fail
G-3rd	11liv2	76.7	N/A	Fail
I00LG	01bed1	0.11	95.5	Fail
I00LG	01bed2s	1.49	87	Fail
I00LG	01hall	0.91	N/A	Pass

BE LEAN: PASSIVE DESIGN MEASURES AND EFFICIENT SERVICES

STONEY WOOD QUARTER, THE FAIRWAY, NW7 3HS

Several passive design measures and measures improving energy efficiency of building services have been included in the design to underline the “Passive first” approach in the scheme design. Implemented measures are summarised in Table 3 of this report and include:

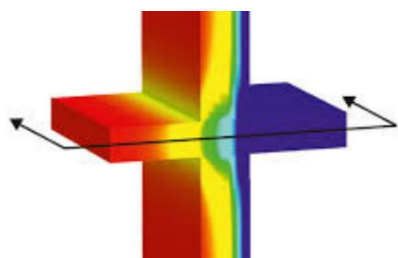
LOW U-VALUES OF BUILDING FABRIC



Thermal performance of fabric is the most important aspect of passive measures mosaic. Low U-values ensure, that the amount of heat transmitted through building external elements is minimised. This is achieved by using highly insulated building materials with low thermal conductivity.

Notional dwelling U-values as set out in 2021 Part L1 are generally followed with significant improvements in some elements, e.g. triple glazed windows.

AVOIDANCE OF THERMAL BRIDGING



Thermal bridges occur at all junctions between building thermal elements, typically at junctions between wall/floor, wall/roof etc. Recent changes in the building regulations have emphasized the significance of thermal bridging in building design.

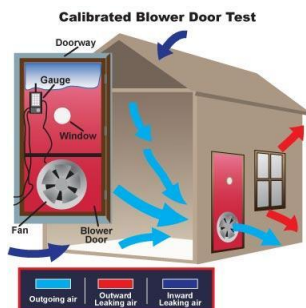
Continuity of insulation has to be maximised in order to minimise thermal bridging. Calculations presented in this energy statement and current proposal are based on thermal bridging Psi-values equivalent to notional dwelling specification Psi-values listed in SAP10.2 table R2. This is a conservative estimate of Psi-values, equivalent to 2021 Part L1 notional building performance, which has been consistently achieved in similar projects with the same construction type (hybrid steel frame walls, insulated balcony connectors). Psi-values of all applicable junctions will be assessed by a suitably qualified assessor at the detailed design stage by either:

- Custom Psi-value calculation by 2D thermal modelling
- Psi value from database of approved details

BE LEAN: PASSIVE DESIGN MEASURES AND EFFICIENT SERVICES

STONEY WOOD QUARTER, THE FAIRWAY, NW7 3HS

AIR TIGHTNESS



Air tight buildings minimise their heat loss through infiltration of cold air through gaps and cracks in building envelope. Air tightness of buildings is expressed as air permeability rate. Air permeability rate of $3.0 \text{ m}^3/\text{h.m}^2$ is set out as a reference value for the current building regulations notional dwelling. This value has to be confirmed by post-construction air tightness testing.

HIGH EFFICIENCY LIGHTING



While previous versions of Part L1 recognised low energy lighting to certain degree, the impact of low energy lighting is more accurate and more significant in 2021 Part L. All installed light fittings need to be included in detail in the assessment. To meet the efficiency level of notional reference dwelling, the installed power density shouldn't exceed 2.3 W/m^2 and all light fittings should achieve a luminaire efficacy of at least 80 lm/W .

WATER EFFICIENCY



Reducing general water consumption in dwellings also reduces amount of energy needed to provide hot water. Part L1 notional building therefore allows for overall water consumption of 125 l/person.day and more specifically, showers with flow rate of 8 l/min .

BE CLEAN: DISTRICT HEATING AND CHP

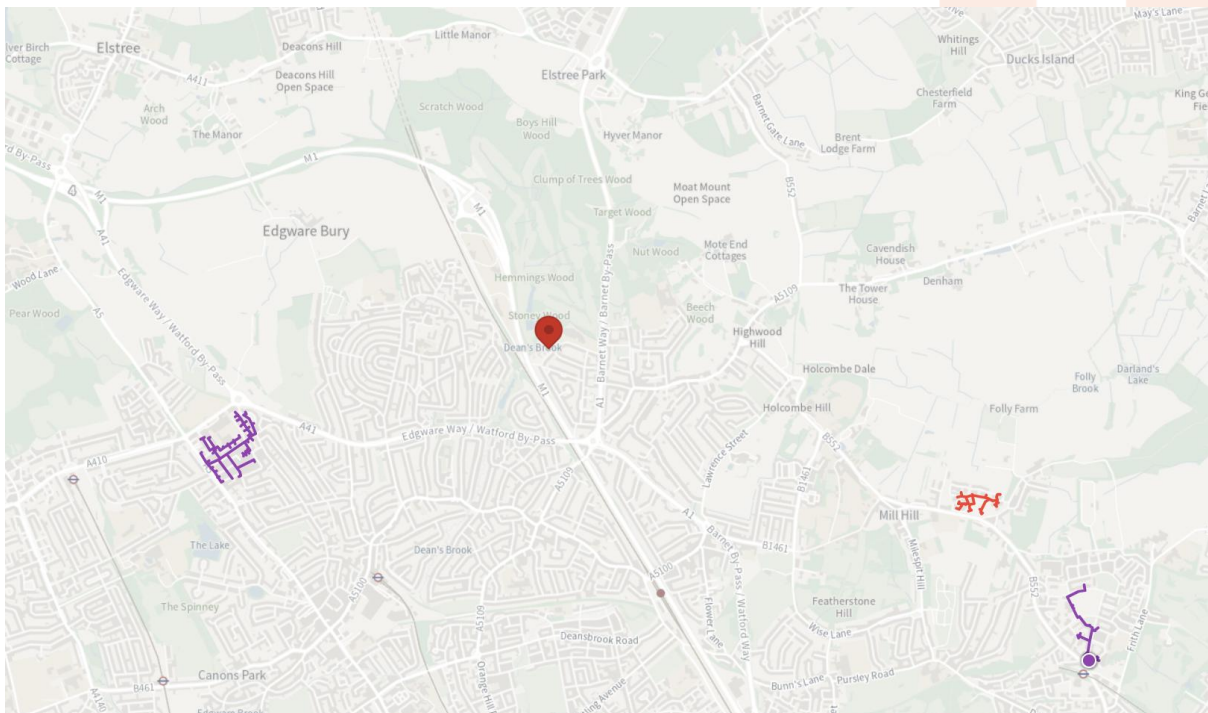
STONEY WOOD QUARTER, THE FAIRWAY, NW7 3HS

COMBINED HEAT AND POWER

Although gas CHP's used to help to reduce CO2 emissions by delivering heat and electricity locally and reducing the losses that normally occur by conventional power plants. This is no longer true, after significant grid electricity decarbonisation in recent years. Any local electricity generation using fossil fuels (e.g. mains gas) will deliver electricity with higher carbon footprint than grid electricity. Combined heat and power is therefore no longer considered a low carbon technology.

DISTRICT HEATING CONNECTION

There is no existing or planned heating network in the proximity of site, according to current London Heat Map



BE GREEN: ON-SITE RENEWABLE ENERGY SOURCES

STONEY WOOD QUARTER, THE FAIRWAY, NW7 3HS

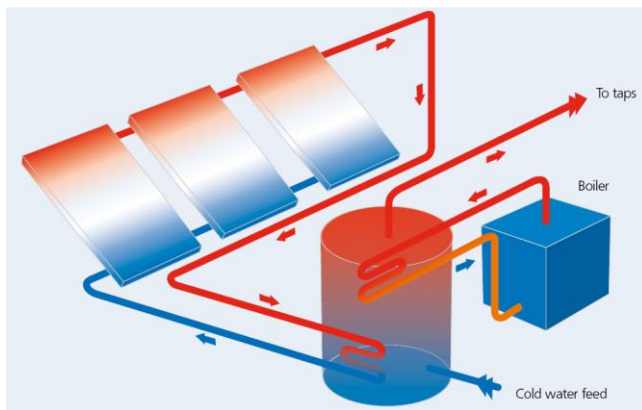
BE GREEN: ON-SITE RENEWABLE ENERGY SOURCES – SOLAR HOT WATER

GENERAL INFORMATION

Solar hot water systems for dwellings use collector which provides a separate heating circuit for hot water cylinder. This is usually backed up by electric immersion heater or other source of heat.

Two types of collectors are available:

- Flat Plate – less expensive, less efficient
- Evacuated Tube – more expensive and more efficient



RECOMMENDATIONS SPECIFIC TO THIS DEVELOPMENT

Solar hot water system has been ruled out due to high installation cost maintenance requirements space requirement. Other renewable technology (ASHP) is preferred for hot water heating.

BE GREEN: ON-SITE RENEWABLE ENERGY SOURCES

STONEY WOOD QUARTER, THE FAIRWAY, NW7 3HS

BE GREEN: ON-SITE RENEWABLE ENERGY SOURCE - AIR SOURCE HEAT PUMPS

GENERAL INFORMATION

An air source heat pump extracts heat from the outside air in the same way that a fridge extracts heat from its inside. It can extract heat from the air even when the outside temperature is as low as minus 15° C.

On 17 December 2008, the European Parliament adopted the EU Directive on promoting the use of energy from renewable sources. For the first time however, in addition to geothermal energy, aerothermal and hydrothermal energy are also recognised as renewable energy sources.

There are two main types of ASHP:

AIR-TO-WATER SYSTEM

Air-to-water system uses the heat to warm water. Heat pumps heat water to a lower temperature than a standard boiler system would, so they are more suitable for underfloor heating systems than radiator systems. Although some ASHP systems are capable of heating the water to the higher temperature, the efficiency is higher when using low temperature underfloor heating or low temperature fan convectors.



BE GREEN: ON-SITE RENEWABLE ENERGY SOURCES

STONEY WOOD QUARTER, THE FAIRWAY, NW7 3HS

AIR-TO-AIR SYSTEM

Air-to-air system uses the heat to warm the indoor air. The air is heated through individual fan-coils or centrally and then distributed to rooms via ductwork.



RECOMMENDATIONS SPECIFIC TO THIS DEVELOPMENT

It is proposed to install a communal air source heat pump systems comprising 3 heat pump systems, each consisting of modular SAV/Thermonova DELTA-HP modular heat pumps. This system will provide all space heating and hot water to all flats through heat interface units (estimated total heat demand 2,100 MWh). Space heating will be provided by underfloor heating or low temperature radiators / convectors. The proposed system has a calculated SCoP of 3.30 (attached datasheets). This SCoP is used in the SAP and SBEM calculation for Be Green scenario.

Distribution loss factor of 1.5 is used for the calculation, as a SAP default value for heat network designed and commissioned in accordance with the CIBSE/ADE 'Heat Networks: Code of Practice for the UK'



BE GREEN: ON-SITE RENEWABLE ENERGY SOURCES

STONEY WOOD QUARTER, THE FAIRWAY, NW7 3HS

BE GREEN: ON-SITE RENEWABLE ENERGY SOURCE - SOLAR PHOTOVOLTAICS

GENERAL INFORMATION

This system uses semi-conductor cells to convert solar energy into electricity. Two main types of PV panels are available:

- Monocrystalline – More expensive and more efficient
- Polycrystalline – Less expensive and less efficient

Depending on type, the output of 1 kWp (kilowatt peak) can be achieved by panels with area between 6 and 20 m².

The use of PV panels generally requires relatively large unshaded roof area where they can be mounted facing south, ideally having between 30° and 40° inclination.



RECOMMENDATIONS SPECIFIC TO THIS DEVELOPMENT

It is proposed to install a solar PV system with total peak output of 100.8 kWp on the flat roofs, allocated to residential units (communal system without individual flat connections). Additional 10 kWp will be allocated to non-residential spaces.

This is currently estimated as the maximum solar PV that can be fitted on the roofs after allowing for areas taken up by amenity and plant equipment.

The PV panels will be installed horizontally (less than 15° pitch to maximise the installed capacity)

The proposed PV system will produce 79,023 kWh electricity per year (calculated using SAP10.2). In addition the non residential PV will produce 7,778kWh electricity per year.

BE GREEN: ON-SITE RENEWABLE ENERGY SOURCES

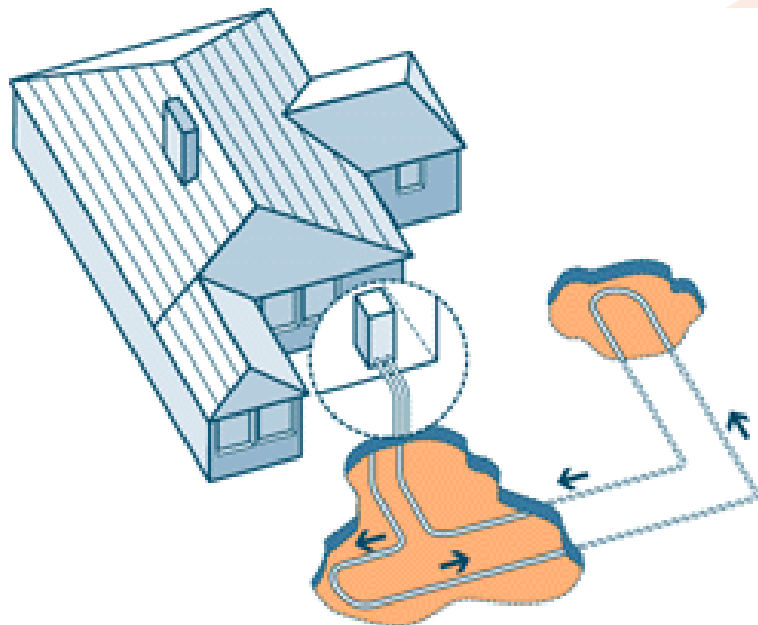
STONEY WOOD QUARTER, THE FAIRWAY, NW7 3HS

BE GREEN: ON-SITE RENEWABLE ENERGY SOURCE - GROUND SOURCE HEAT PUMP

GENERAL INFORMATION

Ground source heat pumps use a buried ground loop which transfers heat from the ground into the building through heating distribution system. GSHP technology can be used both for heating and cooling. Two main types of GSHP are available:

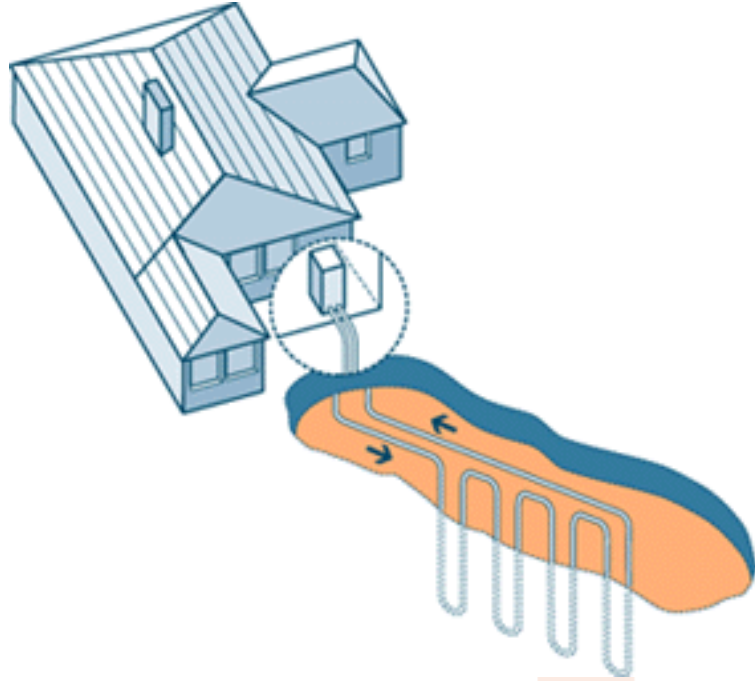
- Horizontal loop is suitable for applications where sufficient area is available to accommodate horizontally buried pipes



BE GREEN: ON-SITE RENEWABLE ENERGY SOURCES

STONEY WOOD QUARTER, THE FAIRWAY, NW7 3HS

- Vertical loop system can be used where ground space is limited, but will require boreholes typically 15-150m deep, and is consequently more expensive to install than horizontal systems.



RECOMMENDATIONS SPECIFIC TO THIS DEVELOPMENT

Ground source heat pumps have been ruled out due to higher installation cost and relatively small CO₂ savings compared to ASHP.

BE GREEN: ON-SITE RENEWABLE ENERGY SOURCES

STONEY WOOD QUARTER, THE FAIRWAY, NW7 3HS

BE GREEN: ON-SITE RENEWABLE ENERGY SOURCE - BIOMASS / BIOFUELS

GENERAL INFORMATION

Producing energy from biomass has both environmental and economic advantages. It is a carbon neutral process as the CO₂ released when energy is generated from biomass is balanced by that absorbed during the fuel's production. There are two main ways of using biomass to heat a domestic property:

- Standalone stoves providing space heating for a room. These can be fuelled by logs or pellets but only pellets are suitable for automatic feed. Generally they are 6-12 kW in output, and some models can be fitted with a back boiler to provide water heating.
- Boilers connected to central heating and hot water systems. These are suitable for pellets, logs or chips, and are generally larger than 15 kW.

RECOMMENDATIONS SPECIFIC TO THIS DEVELOPMENT

Biofuels are ruled out due to negative impact on air quality and environmental issues surrounding liquid biofuels as currently there are no established standards relating to the sustainability of biofuels.

BE GREEN: ON-SITE RENEWABLE ENERGY SOURCES

STONEY WOOD QUARTER, THE FAIRWAY, NW7 3HS

BE GREEN: ON-SITE RENEWABLE ENERGY SOURCE - WIND ENERGY

GENERAL INFORMATION

Wind power is a clean, renewable source of energy which produces no carbon dioxide emissions or waste products. The turbines can have horizontal or vertical axis (Darrieus type). Wind turbines use the wind's lift forces to rotate aerodynamic blades that turn a rotor which creates electricity. Most small wind turbines generate direct current (DC) electricity and are not connected to the national grid. A special inverter and controller is required to convert DC electricity to AC at a quality and standard acceptable to the grid if the turbine is to be connected to national grid.

RECOMMENDATIONS SPECIFIC TO THIS DEVELOPMENT

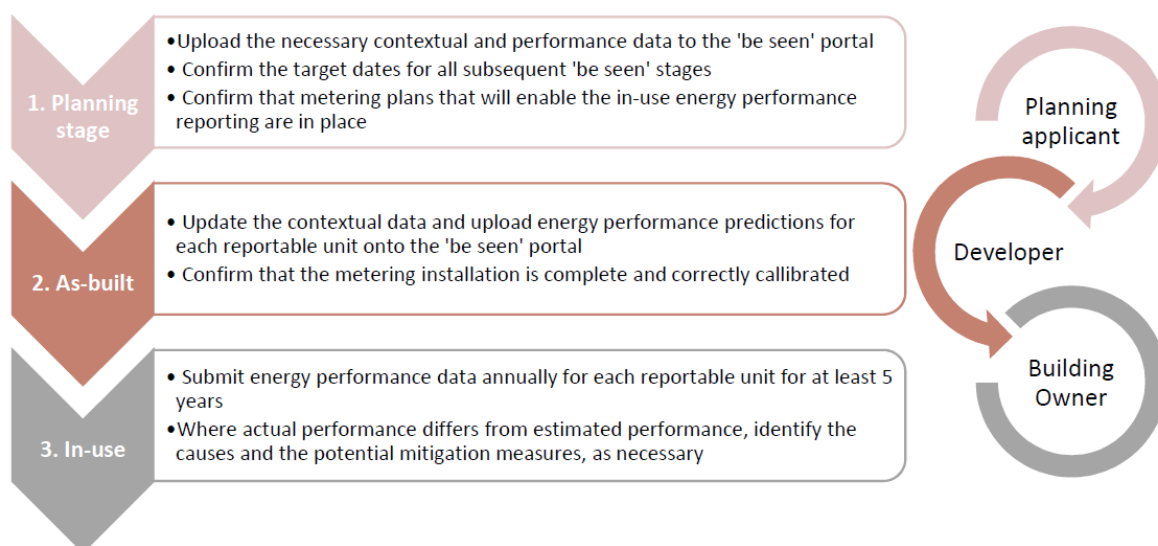
Wind energy systems will not be considered due to negative visual effects, interference, flicker and noise risk. Exposure to wind would be limited by surrounding buildings.

BE SEEN – ENERGY MONITORING

STONEY WOOD QUARTER, THE FAIRWAY, NW7 3HS

London Plan Policy SI 2 sets out the 'be seen' requirement for all major development proposals to monitor and report on their actual operational energy performance. The 'be seen' policy will help to understand the performance gap and identify ways of closing it while ensuring compliance with London's net zero-carbon target.

To fully address the "be seen" requirements, the development will be designed to enable post construction monitoring and the information set out in the 'be seen' guidance will be submitted to the GLA's portal at the appropriate reporting stages and be secured by planning conditions.



WATER EFFICIENCY

STONEY WOOD QUARTER, THE FAIRWAY, NW7 3HS

Internal Water consumption will be reduced by specification of water efficient fittings. The water consumption in the proposed flats will be reduced to 105 litres per person per day or less by specifying water fittings with the following parameters:

WC's: All dual flush capacity 3/6 Litres or less

Kitchen taps flow rate: 8 l/min or less

Bathroom taps flow rate: 6 l/min or less

Bath capacity to overflow: 140 l or less

Showers flow rate: 8 l/min or less

Dishwasher consumption: 0.5 Litres per place setting or less

Washing machine consumption: 6 litres per kg dry load or less

CONCLUSION

STONEY WOOD QUARTER, THE FAIRWAY, NW7 3HS

The London Plan approach of “Be lean” – “Be clean” – “Be green” is fully adopted by implementing:

- Passive measures (low U-values, air permeability, avoidance of thermal bridging by accredited details)
- High efficiency services, i.e., high efficiency ventilation with heat recovery, high efficiency lighting
- Renewable sources: Air source heat pumps, Solar PV

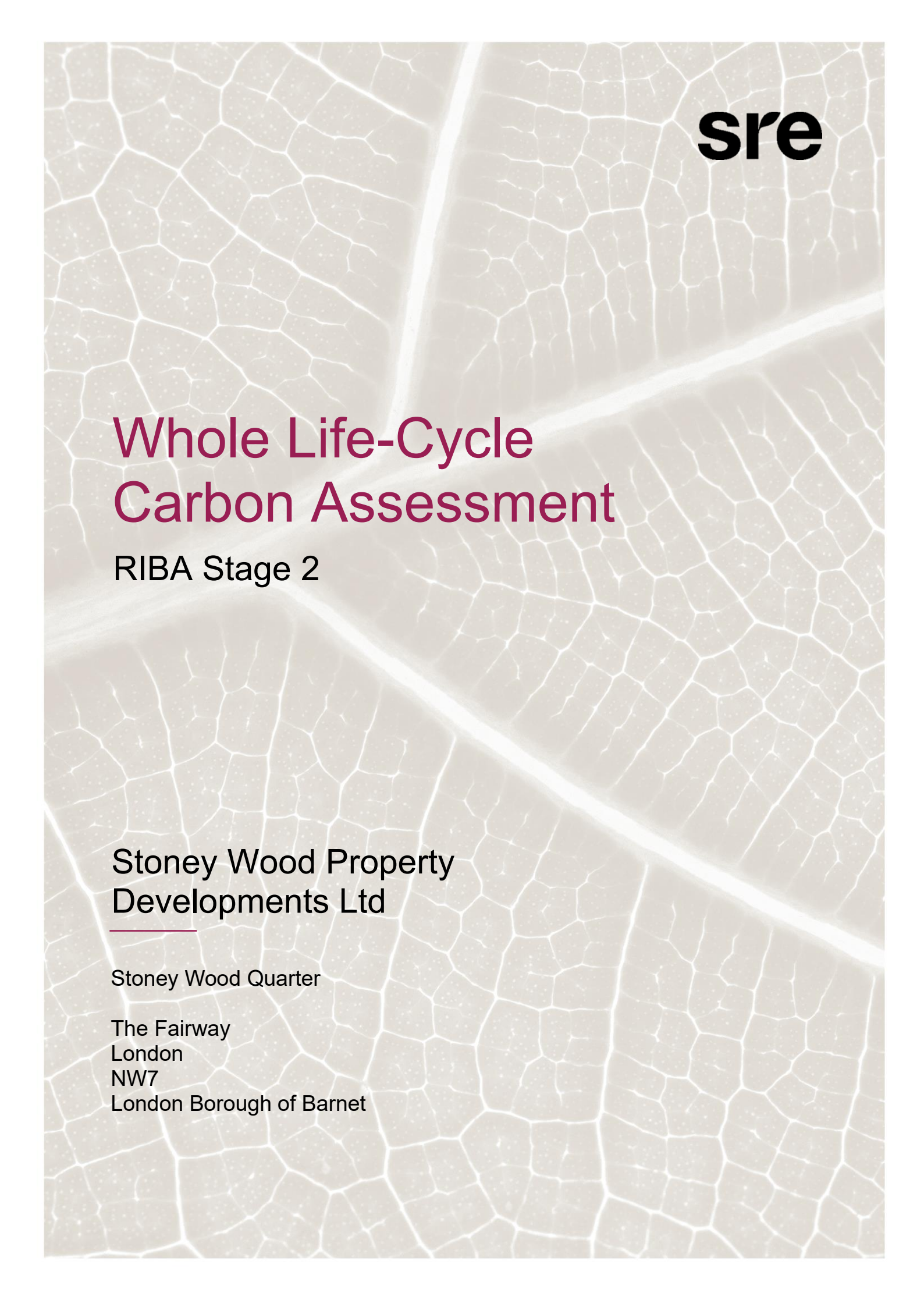
Excluded renewable sources are:

- Solar hot water
- Biomass
- Wind turbines

The proposed development will achieve:

- 74% overall regulated CO2 reduction against 2021 Part L compliant baseline
- 57% overall regulated CO2 reduction by renewable sources
- 17% overall regulated CO2 reduction by efficiency measures (“Be Lean” stage of the energy hierarchy)
- The remaining shortfall will be met by a carbon offsetting contribution and “Be seen” energy monitoring will be secured by planning conditions.

Overheating simulations show that the tested residential units fail on the TM59 thermal comfort criteria using the main TM49 weather file (DSY1), which is due to limited window opening dictated by Noise Assessment. Mechanical cooling using hybrid MVHR add-on units is therefore proposed as the final step of the GLA cooling hierarchy.



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Whole Life-Cycle Carbon Assessment

RIBA Stage 2

**Stoney Wood Property
Developments Ltd**

Stoney Wood Quarter

The Fairway
London
NW7
London Borough of Barnet

Version	Revision	Date	Author	Reviewer	Project Manager
1	A	21.05.2025	Samantha May	Lamya Salem	Lamya Salem
1	B	22.05.2025	Samantha May	Lamya Salem	Lamya Salem
1	C	09.06.2025	Lamya Salem	-	Lamya Salem
1	D	15.06.2025	Lamya Salem	-	Lamya Salem
1	E	19.06.2025	Lamya Salem	-	Lamya Salem
1	F	20.03.2026	Lamya Salem	-	Lamya Salem
1	G	27.03.2026	Lamya Salem	-	Lamya Salem

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Executive Summary

This Whole Life Carbon Assessment (WLCA) has been prepared by SRE Ltd on behalf of Stoney Wood Property Developments Ltd (The Client) in support of an application for full planning permission for Stoney Wood Quarter, Barnet (The Proposed Development), within the system boundary.

The Proposed Development is for “*Redevelopment of the site for use as residential (Class C3), in new buildings up to ground plus 5 storeys. Ancillary flexible (Class E) uses at ground floor level. Together with plant, play space, car and cycle parking, hard and soft landscaping and all other works associated with the development*”.

This WLCA has been conducted in accordance with the BS EN 15978: 2011 ‘Sustainability of Construction Works’ principles¹, which is the standard UK framework for appraising the environmental impacts of the built environment. This assessment has also followed the methodology outlined in the London Plan Whole Life-Cycle Carbon Assessments Guidance (March 2022)² and RICS Professional Standard, Whole Life Carbon Assessment for the Built Environment (2nd edition)³. The embodied carbon footprint has been calculated using the One Click LCA tool, while energy consumption and related carbon emissions during operation for the Proposed Development has been predicted.

The assessment comprehensively evaluates the entire life cycle of the Proposed Development, covering Modules A, B, C, and D as defined by BS EN 15978. Over the 60-year Reference Study Period (RSP), the total life-cycle carbon impact of the development is projected to be 1,737 kgCO₂e/m², as detailed in Table 1.

The key findings include:

- Operational carbon emissions, encompassing both regulated and unregulated energy use, amount to 38,188,890 kgCO₂e, equivalent to 970 kgCO₂e/m² over the life cycle of the project.
- Embodied carbon emissions are estimated at 472 kgCO₂e/m².

Life-cycle Modules (BS EN 15978)			Global warming potential - non-decarbonised scenario	
			kgCO ₂ e	kgCO ₂ e/m ²
Product Sourcing and Construction Stage	A1-A3	Product Stage	15,870,697	403
	A1-A3 Biogenic Carbon	Product Stage - Carbon Sequestration	-7,444,748	-189
	A4	Transport to Project Site	1,477,171	38
	A5	Construction and Installation Process	1,232,039	31
Use Stage	B1	Use	1,476	0.04
	B2	Maintenance	393,630	10

¹ BS EN 15978: 2011 ‘Sustainability of Construction Works’ principles

² London Plan Whole Life-Cycle Carbon Assessments Guidance (March 2022)

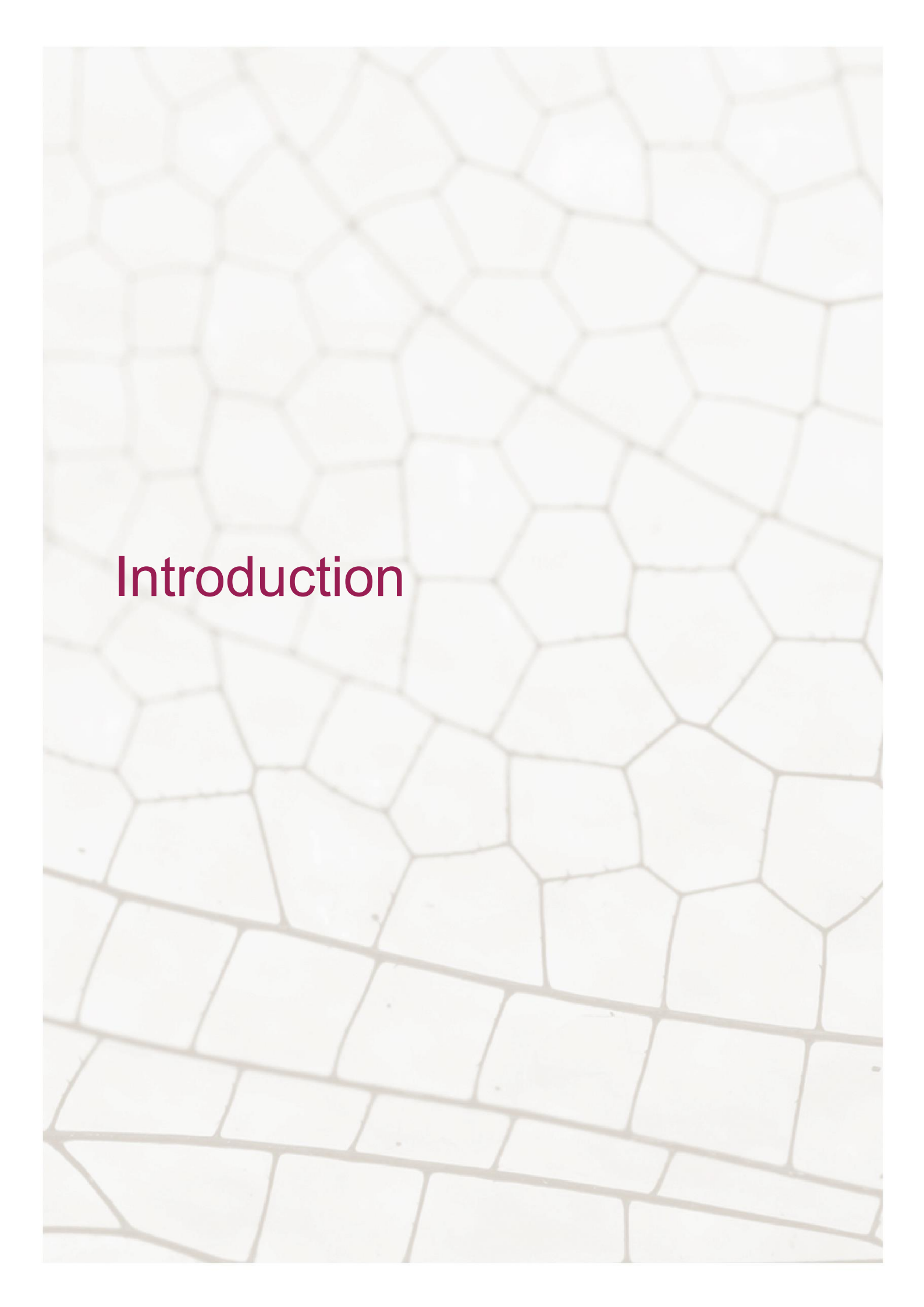
³ RICS Professional Standards – Whole life carbon assessment for the built environment (2nd Edition, Version 2, November 2023)

Life-cycle Modules (BS EN 15978)			Global warming potential - non-decarbonised scenario	
			kgCO ₂ e	kgCO ₂ e/m ²
	B3	Repair	1,685,477	43
	B4	Replacement	11,167,426	284
	B5	Refurbishment	0	0
Use Stage - Operational Carbon	B6	Operational Energy Use	37,235,174	946
	B7	Operational Water Use	953,716	24
End-of-Life Stage	C1	Deconstruction/Demolition	133,834	3
	C2	Transport to Disposal Facility	341,326	9
	C3	Waste Processing	8,127,868	206
	C4	Disposal	1,089	0
Upfront Carbon	A1-A5		18,579,906	472
Life-cycle Embodied Carbon	A-C (excl B6 & B7)		32,987,284	838
Life-cycle Operational Carbon	B6 & B7		38,188,890	970
Benefits and Loads Beyond the System Boundary	D	Reuse, Recovery, Recycling Potential	-2,789,746	-71
Whole Life-cycle Carbon	A-C		68,386,428	1,737

Table 1 - Carbon Emissions per Life-cycle Stage of the Proposed Development

Module	WLC benchmark (kg CO ₂ e/ m ² GIA)	Aspirational WLC benchmark (kg CO ₂ e/ m ² GIA)	Result for this development
A1-A5 (excluding sequestration/ biogenic carbon)	<850	<500	472
B1-B5, C1-C4 (excluding B6 & B7)	<350	<300	555
A-C (excluding B6 & B7, including sequestration)	<1200	<800	838

Table 2 - Comparison of results with the GLA WLCA benchmarks

The background of the slide is a microscopic image of plant tissue, showing a network of cells with thick, brownish cell walls. The cells are mostly polygonal in shape, with some appearing more rounded and others more elongated. The overall color is a light beige or off-white, with the cell walls providing a darker, brownish outline for each cell.

Introduction

1.0 Introduction

This Whole Life Carbon Assessment (WLCA) has been prepared by SRE Ltd on behalf of Stoney Wood Property Developments Ltd (The Client) during RIBA Stage 2, to quantify and report the anticipated carbon emissions across all life cycle stages of Stoney Wood Quarter, Barnet (The Proposed Development), within the system boundary.

The WLCA has been undertaken in accordance with the London Plan Whole Life-Cycle Carbon Assessments Guidance (March 2022) which outlines calculation of the Whole Life-Cycle Carbon (WLC) emissions in line with Policy SI 2 F of the 2021 London Plan⁴. The assessment has followed the methodology outlined in RICS Professional Standard, Whole life carbon assessment for the Built Environment (2nd edition, November 2023), which provides technical detail and calculation requirements on the practical implementation of the BS EN 15978: 2011 'Sustainability of Construction Works' principles.

The assessment involves the input of information detailed within drawings and Revit model received from the Design Team into the OneClick LCA tool to evaluate the associated embodied carbon impacts with the Proposed Development. To evaluate the development's operational energy demand, the assessment employs the industry-recognized SAP energy modelling software, following the methodology outlined in the Standard Assessment Procedure and Part L procedure.

A 60-year Reference Study Period (RSP) has been applied to calculate the whole life-cycle carbon emissions of the Proposed Development. The assessment identifies key carbon hotspots and outlines targeted mitigation strategies to reduce carbon emissions, with a particular focus on minimizing embodied carbon.

The figures within this report may be based on indicative modelling and an assumed specification outlined within the relevant sections. Therefore, this modelling may not represent the as built emission or energy use of the Proposed Development and further modelling may need to be undertaken at detailed design stage to confirm precise performance figures.

1.1 The Site and Proposed Development

The Proposed Development includes *“Redevelopment of the site for use as residential (Class C3), in new buildings up to ground plus 5 storeys. Ancillary flexible (Class E) uses at ground floor level. Together with plant, play space, car and cycle parking, hard and soft landscaping and all other works associated with the development”*.

The Site is located on the northern side of the Fairway in the north of the London Borough of Barnet. It is to the east of the M1 and west of Barnet Way.

The Site is approximately 23,000 sqm in size and has no prevailing or dominant architectural style north of the Fairway, typology or local context. It is highly varied and the housing development which surrounds it is wedged between the M1 and Thameslink/Midland Mainline to the west and the A1 Barnet Way to the east. The south is dominated by a variety of interwar “metroland” semi-detached houses. There are flats and maisonettes located within the area in addition to larger family homes.

⁴ [The London Plan, March 2021](#)

The site is bounded by Fairway and Northway School to the east and Stoney Wood woodland to the west which merges into Mill Hill Golf Course north and northeast of the Site. To the south of the Site is residential, with detached and semi-attached dwellings situated on large plots with front and rear gardens.

Figure 1 demonstrates the location of the Proposed Development.

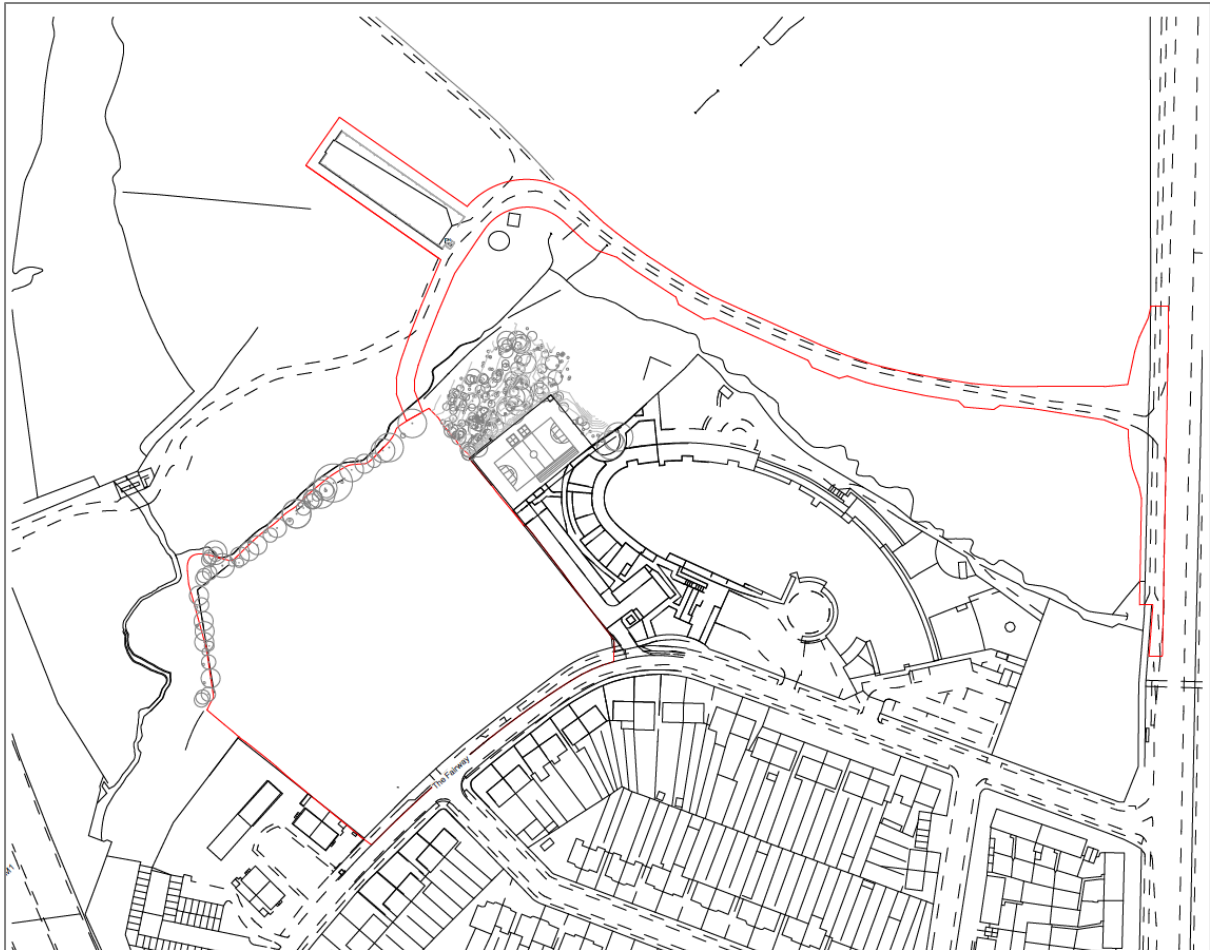


Figure 1 - Location of the Proposed Development



Figure 2 – Proposed Site Plan

1.2 Existing Developments

The site has a limited planning history, an application is currently pending consideration (ref. 24/1308/FUL) for “Retrospective temporary change of use of land to B8 storage and distribution for 2 years”. A similar application was withdrawn in 2024 for a similar proposal.

It is currently in use as a car impound yard and is hoarded on all sides. It is bounded by Stoney Wood itself to the north, the Fairway and Northway Schools to the east and residential accommodation and a car scrap yard to the west. The site appears to have contained education buildings until the early 2010’s which were demolished until the new school was provided adjacent with the land then vacant until the car impound yard was instated in 2023.

The site currently has no existing development. Hence, no major demolition activities will occur on site.

For the purpose of whole life-cycle carbon, pre-construction stage carbon emissions will be estimated based on the assumptions outlined in section 3.5.

1.3 Policy & Regulations

Table 3 below summarises the relevant planning requirements with regard to whole-life cycle carbon strategies.

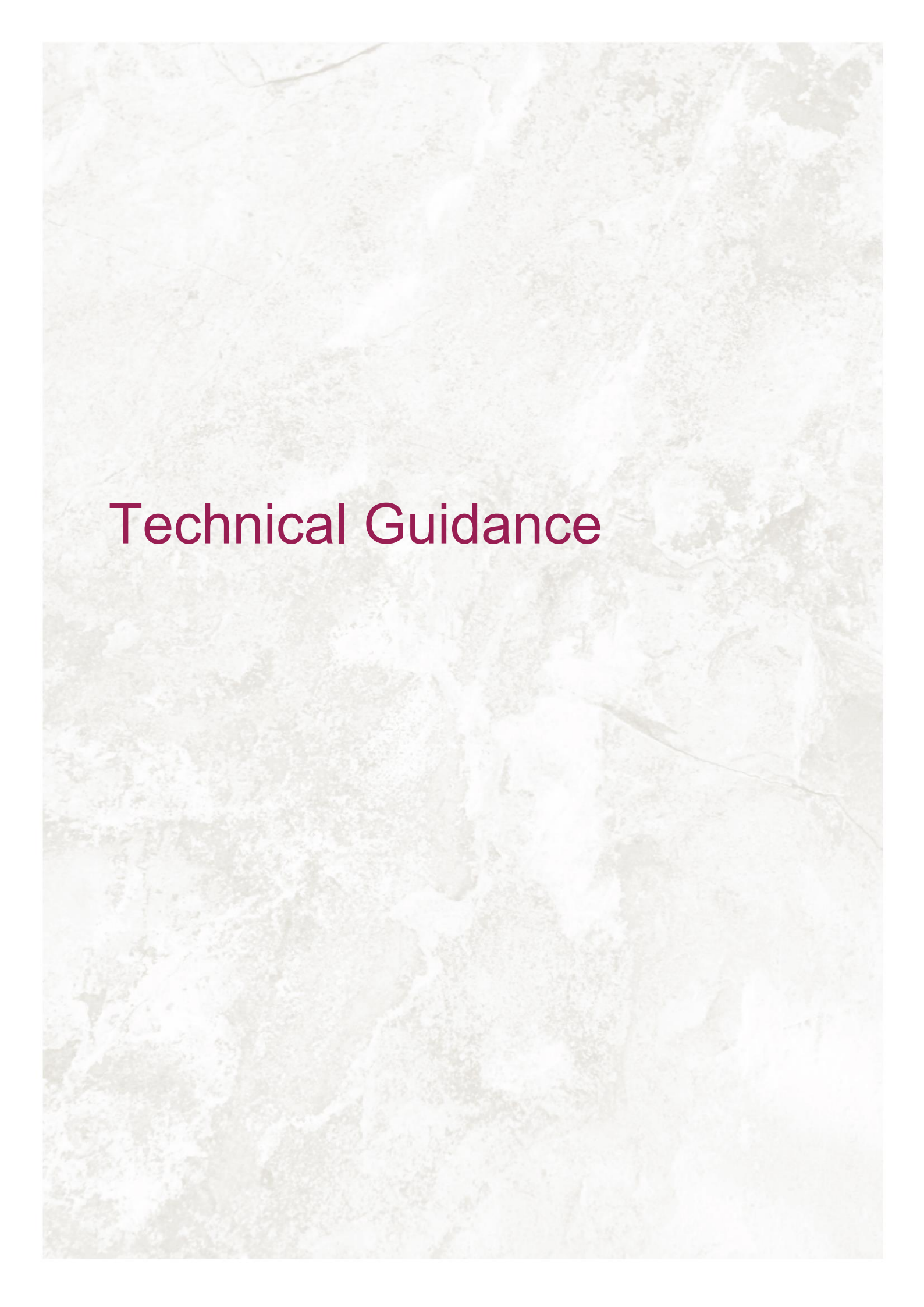
Planning Policy	Requirement
The London Plan 2021	<u>Policy SI 2 Minimising greenhouse gas emissions</u>
	F. Development proposals referable to the Mayor should calculate whole life-cycle carbon emissions through a nationally recognised Whole Life-Cycle Carbon Assessment and demonstrate actions taken to reduce life-cycle carbon emissions.
The London Plan 2021	<u>Policy SI 7 Reducing waste and supporting the circular economy</u>
	A. Resource conservation, waste reduction, increases in material re-use and recycling, and reductions in waste going for disposal will be achieved by the Mayor, waste planning authorities and industry working in collaboration to: 1) promote a more circular economy that improves resource efficiency and innovation to keep products and materials at their highest use for as long as possible 2) encourage waste minimisation and waste prevention through the reuse of materials and using fewer resources in the production and distribution of products 3) ensure that there is zero biodegradable or recyclable waste to landfill by 2026 4) meet or exceed the municipal waste recycling target of 65 per cent by 2030 5) meet or exceed the targets for each of the following waste and material streams:

Planning Policy	Requirement
	a) construction and demolition – 95 per cent reuse/recycling/recovery b) excavation – 95 per cent beneficial use 6) design developments with adequate, flexible, and easily accessible storage space and collection systems that support, as a minimum, the separate collection of dry recyclables (at least card, paper, mixed plastics, metals, glass) and food
Barnet Local Plan 2021 - 2036 ⁵	<u>Chapter 6 Character, Design and Heritage</u> 6.4 Promoting High Quality Design 6.4.5 Reducing carbon dioxide (CO₂) emissions and adapting to future climate change are priorities for the Local Plan. All developments need to aim for zero carbon and should represent good quality design that demonstrates high levels of environmental awareness contributing to climate change mitigation and adaptation. <u>Chapter 10 Environment and Climate Change</u> 10.5 Carbon Reduction 10.5.4 In accordance with London Plan Policy SI 2F, development proposals referable to the Mayor of London are required to calculate whole life cycle carbon emissions and demonstrate actions taken to reduce life-cycle carbon emissions. A whole life-cycle approach is needed to capture: - unregulated emissions (i.e. those associated with cooking and small appliances), - embodied emissions (i.e. those associated with raw material extraction, manufacture and transport of building materials and construction), and - emissions associated with maintenance, repair and replacement as well as dismantling, demolition and eventual material disposal.
Barnet - Zero	<u>Our Vision</u> As we move forward, we will take action that will: • champion zero carbon development and affordable homes • build a local green economy with sustainable jobs and suppliers • support residents, communities and businesses in making sustainable choices • foster a sustainable and inclusive future for all generations <u>Our commitment to net zero</u> We are: • committed to reduce the amount of carbon we emit as an organisation

⁵ [Barnet Local Plan 2021-2036 \(Adopted March 2025\)](#)

Planning Policy	Requirement
	• committed to supporting residents, communities and businesses reduce the carbon they emit across the borough • moving towards our ambitions through the delivery of our sustainability action plan • proud of the accelerated pace of change and the progress we have made since May 2022. Whilst putting residents, communities and businesses at the heart of our delivery we have: • championed sustainability • reduced our carbon emissions • raised awareness of the impact of a changing climate on our environment

Table 3 - Summary of Planning Policy requirements

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Technical Guidance

2.0 Technical Guidance

This WLCA has been carried out in line with the BS EN 15978: 2011 (Sustainability of construction works — Assessment of environmental performance of buildings — Calculation method). This is the standard UK framework for appraising the environmental impacts of the built environment. It sets out the principles and calculation method for the whole-life assessment of the environmental impacts from built projects. The following are the industry-wide methodology and standards that comply with BS EN 15978:2011.

2.1 Whole Life Carbon Assessment for the Built Environment, RICS Professional Standard 2nd Edition

RICS Professional Standard (PS) 2nd edition addresses all element and component categories making up a built asset, during every stage: from extracting raw materials and manufacturing constituent construction products, through operation, to recovery or disposal at end of life. It also assesses the potential loads and benefits of recovery beyond the system boundary in the next life cycle. All aspects of WLCAs covered by this document are explained and put into context.

This document can be applied to any type of construction or civil engineering project, including building and/or infrastructure assets involving any of the following:

- New construction/new-build assets
- Demolition of existing and construction of new assets
- Retrofit/refurbishment of existing assets
- Masterplans with multiple built assets, including associated project infrastructure, and
- Fit-out of built assets.

2.2 Whole Life-cycle Carbon Assessments Guidance – Greater London Authority (2022)

The GLA guidance explains how to prepare Whole Life-cycle Carbon (WLC) assessment in line with Policy SI2 F of the London Plan (2021) using the WLC assessment template. Policy SI 2 F applies to planning applications that are referred to the Mayor of London. However, WLC assessments are also supported and encouraged on major applications that are not referable.

This guidance explains how to calculate WLC emissions, and the information required to be submitted to comply with the policy. It also includes information on design principles and WLC benchmarks to aid planning applicants in designing buildings that have low operational carbon and low embodied carbon.

2.3 TM65 Embodied Carbon in Building Services: A Calculation Methodology (2021)

TM65 outlines the need for assessments of embodied carbon of products linked to MEP systems, to increase knowledge and facilitate WLC research in these areas. In this technical manual, embodied carbon is understood as the greenhouse gas emissions (GHG) associated with the making of a product, its installation, maintenance, repair and replacement, and its end of life. It covers the whole life cycle, excluding operational aspects and the potential recovery, reuse or recycling of materials. The embodied carbon associated with MEP design can be

significant in a building's lifetime due to the materials that MEP equipment are made of and high replacement rates.

This guidance provides a consistent approach for:

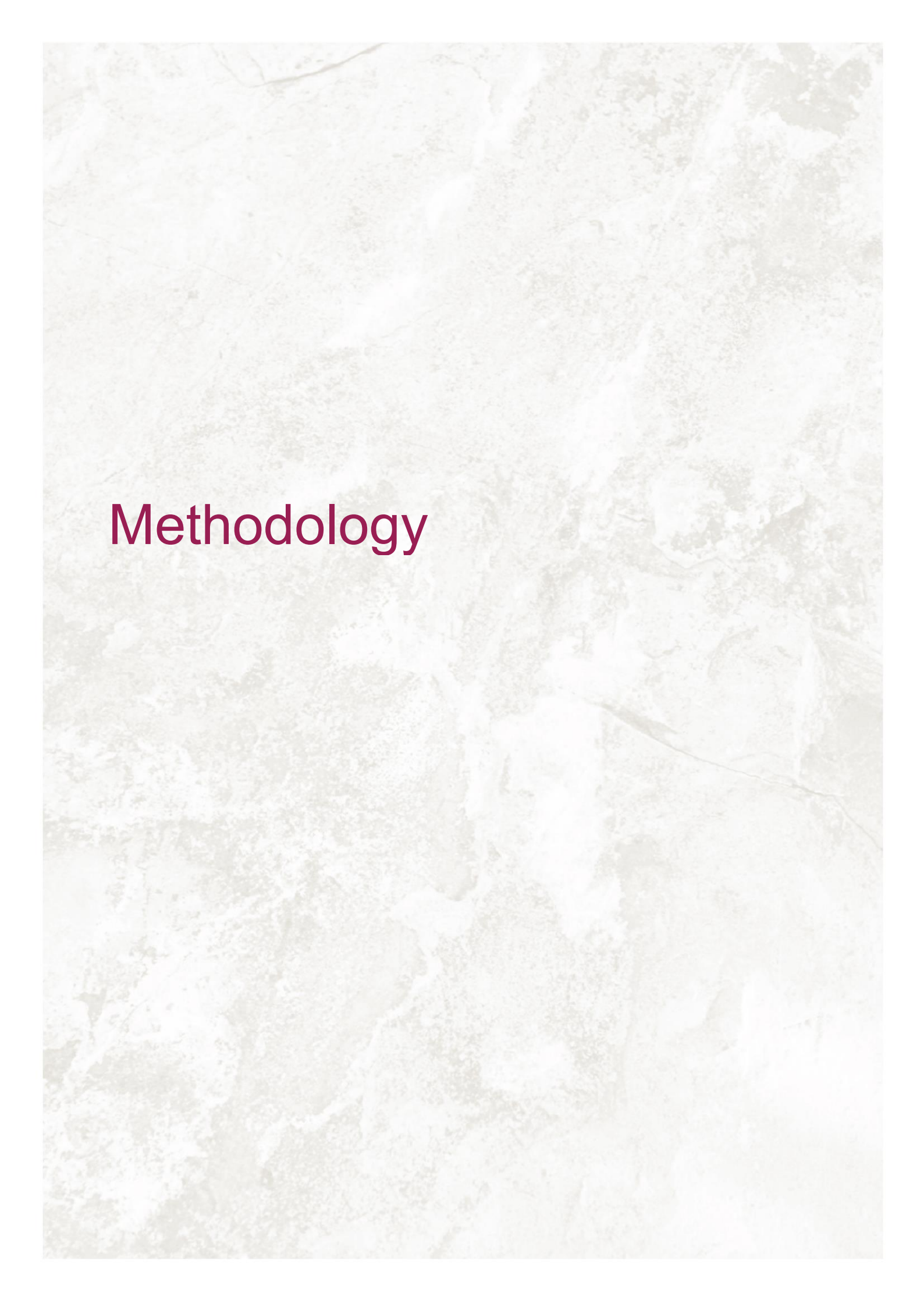
- The data required from manufacturers
- An embodied carbon calculation methodology for MEP products, depending on how much information from manufacturers is available
- The way in which embodied carbon assessments are reported.

2.4 Standard Assessment Procedure (SAP)

The Standard Assessment Procedure (SAP) for the energy rating of dwellings is the methodology currently used by the government to estimate the energy performance of homes. The methodology has 2 main uses:

- To demonstrate compliance of new homes with Part L of the Building regulations
- To generate Energy Performance Certificates (EPCs) for all homes, which advise occupants, prospective buyers, landlords, and renters of the energy performance of a property

SAP plays a key role in developing, implementing, and monitoring government policies on energy efficiency, fuel poverty and heat decarbonisation, and is used across the whole building industry.

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Methodology

3.0 Methodology

This section outlines the WLC assessment process, including life-cycle modules, WLC principles, data sources, the model inputs for each building elements and modules, and key assumptions.

3.1 Life-cycle Modules

There are four stages in the life of a typical project, described as life-cycle modules, set out by BS EN 15978 and RICS Professional Standards.

- Module A1-A5: Product Sourcing and Construction Stage
- Module B1-B7: Use Stage
- Module C1-C4: End-of-Life Stage
- Module D: Benefits and Loads Beyond the System Boundary

This WLC assessment has covered the entirety of Modules A, B, C and D. As shown in Figure 3, these modules are further broken down into sub-modules, summarised as follows:

- **Product Stage (A1-A3):** Emissions associated with the extraction (A1), transporting (A2) and manufacturing processes (A3) necessary to produce the construction products, components and technical equipment required to construct the asset.
- **Construction Stage (A4-A5):** Emissions arising from the transportation of construction products and the construction process, up to project completion. Module A5 also includes any on-site demolition or strip-out works required at the beginning of the project.
- **In Use Stage (B1-B7):** Emissions generated during the operation of the building. This covers the impact of the use (B1), maintenance (B2), repair (B3), replacement (B4) and refurbishment (B5) of the building as well as energy and water use (B6-B7).
- **End-of-Life Stage (C1-C4):** Emissions addressing the deconstruction, demolition (C1), transport (C2), waste processing (C3) and disposal (C4) of materials.
- **Benefits and Loads beyond the System Boundary (D):** Covers any potential benefit from the reuse, recovery and recycling potential of the building materials or products.

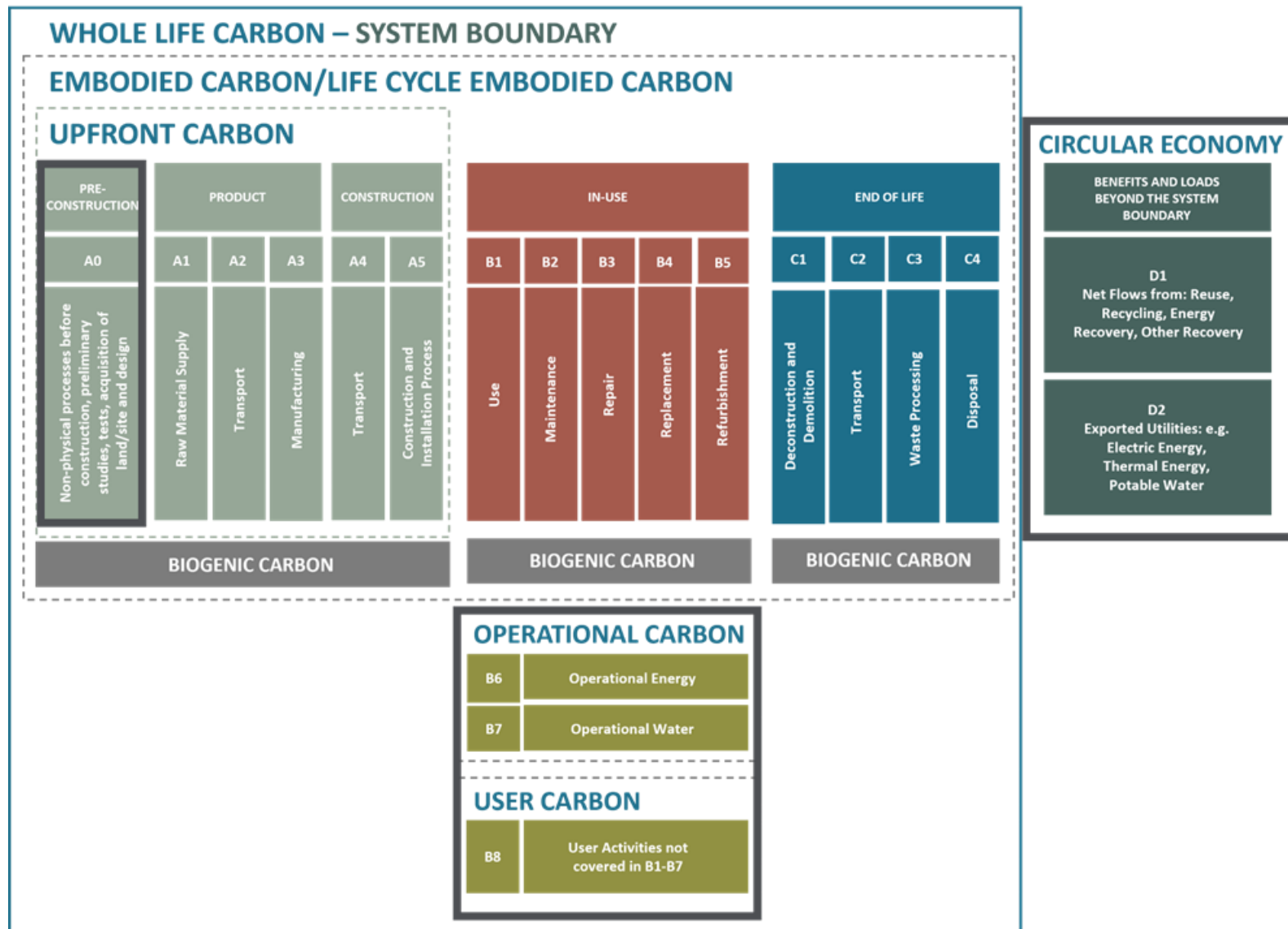


Figure 3 – Building life cycle stages and information modules (RICS WLCA Professional Standard)

3.2 Project Phases

A compliant WLC assessment should be undertaken at the following key project phases.

- **Concept design phase:** Pre-construction forecasts should be used as the project baseline for ongoing carbon reporting and progress tracking throughout the project.
- **Technical design phase:** Pre-construction forecasts should be used to evaluate the evolving design, and at-tender assessments should be used to evaluate tenders.
- **Construction phase:** As specific products are chosen or the design is adjusted, pre-construction forecasts should be reviewed and updated to monitor construction variations.
- **Post-completion phase:** A post-completion assessment should be used to check the carbon reductions predicted in the pre-construction and at-tender forecasts have been achieved.

As the project proceeds, carbon reduction opportunities become fewer, have reduced impact and are potentially more expensive to implement. This is illustrated in Figure 4.

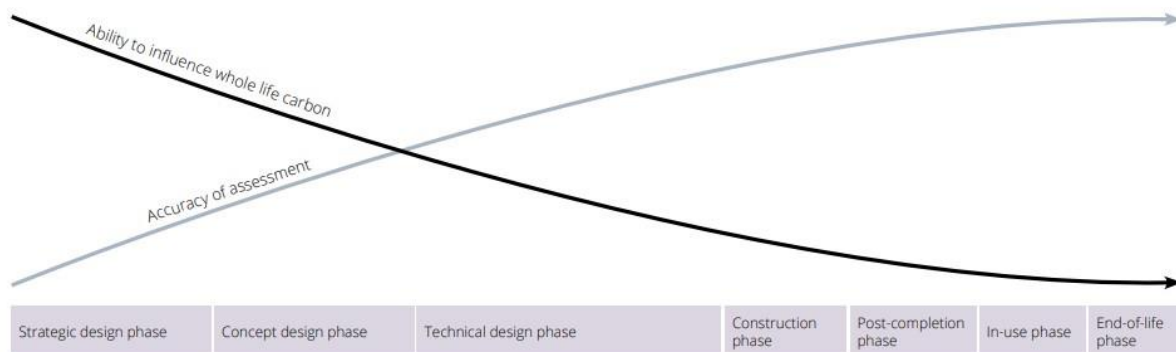


Figure 4 - The ability to influence whole life carbon decreases but the accuracy of assessment increases as the project progresses

The assessment is conducted during RIBA Stage 2 to establish the baseline carbon emissions of the Proposed Development and explore opportunities for reduction. This is achieved by applying the WLC principles outlined in Section 3.3 and developing alternative scenarios to minimize embodied carbon emissions through strategic material selection, as detailed in Section 0.

3.3 Whole Life-cycle Carbon Principles

Table 4 below outlines the WLC principles from the London Plan Guidance (Whole Life-cycle Carbon Assessments). Each principle has been considered in relation to the unique characteristics of the development, as detailed below.

No.	Principle	Description	Relevant life-cycle modules	WLC principles considered for the Proposed Development
1	Reuse and retrofit of existing built structures	Retaining existing built structures for reuse and retrofit, in part or as a whole, should be prioritised before considering substantial demolition, as this is typically the lowest-carbon option. Significant retention and reuse of structures also reduces construction costs and can contribute to a smoother planning process.	A1-A5, B1-B6, C1-C4, D	There are no buildings on the current site and is currently used as a car impound yard.
2	Use repurposed or recycled materials	Using repurposed or recycled materials, as opposed to newly sourced materials, typically reduces the carbon emissions from constructing a new building and reduces waste. This process would start by reviewing the materials already on site for their potential for inclusion into the proposed scheme. Many of the currently available standard products already include a degree of recycled content.	A1-A5, B1-B5, C1-C4, D	As above
3	Material selection	Appropriate low-carbon material choices are key to carbon reduction. Ensuring that materials are selected with consideration of the planned life expectancy of the building reduces waste, the need for replacements, and the in-use costs.	A1-A5, B1-B5, C1-C4, D	The building will be built with concrete structure, brick cladding, internal stud wall etc. Low-carbon materials with long service lifespan are considered and proposed.

No.	Principle	Description	Relevant life-cycle modules	WLC principles considered for the Proposed Development
		It is important to note that the overall lifetime carbon emissions of a product can be as much down to its durability as to what it is made of. For example, bricks may have high carbon emissions in terms of their manufacture, but they have an exceptionally long and durable life expectancy. The selection of reused or recycled materials and products, plus products made from renewable sources, will also help reduce the carbon emissions of a project.		
4	Minimise operational energy use	A 'fabric first' approach should be prioritised to minimise the heating and cooling requirement of a building and the associated systems. Naturally ventilated buildings avoid the initial carbon and financial costs of a ventilation system installation, and the repeat carbon and financial costs of its regular replacement.	A1-A5, B1-B4, B6	It will feature high-efficiency systems such as mechanical ventilation with heat recovery (MVHR), energy-efficient lighting, and renewable technologies including air source heat pumps and rooftop photovoltaic panels.

No.	Principle	Description	Relevant life-cycle modules	WLC principles considered for the Proposed Development
5	Minimise the carbon emissions associated with operational water use	Carbon emissions from water use are largely due to the materials and systems used for its storage and distribution, the energy required to transfer it around the building, and the energy required to treat any wastewater. The choice of materials used and the durability of the systems, which help avoid leakage and resulting damage to building fabric, are therefore key aspects of reducing the carbon emissions of water use. On-site water collection, recycling and treatment, and storage can have additional positive environmental impacts as well as reducing in-use costs.	A1-A5, B1-B7, C1-C4, D	As the Proposed Development is a residential scheme, water usage is expected to be high due to the large number of occupants. To reduce domestic water consumption, the installation of water-efficient fittings, in line with the requirements of Part G, is essential. Operational water uses on-site, including for cleaning, maintenance, and landscaping should also be taken into consideration. In line with Building Regulation Part G, a water consumption of 110 l/p/d will be used to calculate the overall water consumption of the developments.
6	Disassembly and reuse	Designing for future disassembly ensures that products do not become future waste, and that they maintain their environmental and economic value. A simple example is using lime rather than cement mortar - the former being removable at the end of a building's life, the latter not. This enables the building's components (e.g. bricks) to have a future economic value as they can be reused for their original purpose rather than becoming waste or recycled at a lower level (e.g. hardcore in foundations). Designing building systems (e.g. cladding or structure) for disassembly and dismantling has	A1-A5, B1-B5, C1-C4, D	Disassembly and reuse have been considered through flexible design of building layouts. Internal partition walls will be design separately from the structural elements and can be removed or reconfigured easily. Demountable walls, movable panels, or lightweight partitions are considered. Standardized Components will be considered when selecting materials and composite materials will be avoided. Modular bathrooms and kitchens have been considered to streamline the construction and disassembly process.

No.	Principle	Description	Relevant life-cycle modules	WLC principles considered for the Proposed Development
		similar and even broader benefits. Ease of disassembly facilitates easy access for maintenance and replacement leading to reduced maintenance carbon emissions and reduced material waste during the in-use and end-of-life phases. This leads to the potential for material and product reuse which also reduces waste and contributes to the circular economy principle.		
7	Building shape and form	Compact efficient shapes help minimise both operational and embodied carbon emissions from repair and replacement for a given floor area. This leads to a more efficient building overall, resulting in lower construction and in-use costs. A complex building shape with a large external surface area in relation to the floor area requires a larger envelope than a more compact building. This measure of efficiency can be referred to as the 'wall to floor ratio', or the 'heat loss form factor'. This requires a greater use of materials to create the envelope, and a potentially greater heating and/or cooling load to manage the internal environment.	A1-A5, B1-B6	The building has been designed to maximise daylight in all rooms.
8	Regenerative design	Removing carbon from the atmosphere through materials and systems absorbing it makes a direct contribution to carbon reduction. Examples include unfinished concrete, some carpet products and maximising the amount of vegetation.	A1, B1, D	Regenerative Design has been considered. The building will be constructed using concrete.

No.	Principle	Description	Relevant life-cycle modules	WLC principles considered for the Proposed Development
9	Designing for durability and flexibility	Durability means that repair and replacement is reduced which in turn helps reduce lifetime building costs. A building designed for flexibility can respond with minimum environmental impact to future changing requirements and a changing climate, thus avoiding obsolescence which also underwrites future building value. Buildings designed with this principle in mind will be less likely to be demolished at their end-of-life as they lend themselves to future refurbishment. Examples include buildings being designed with 'soft spots' in floors to allow for future modification and design, as well as non-structural internal partitions to allow layout change.	A1-A5, B1-B5, C1-C4, D	Materials with long lifespan are considered when selecting materials.
10	Optimisation of the relationship between operational and embodied carbon	Optimising the relationship between operational and embodied emissions contributes directly to resource efficiency and overall cost reduction. For example, the use of insulation has a clear carbon benefit whereas its fabrication will generate carbon emissions. This means that it is important to look not only at the U-value of insulation, but also the carbon emissions from the manufacture and installation of different product options. Avoiding fully glazed façades will reduce cooling demand and limits the need for high-carbon materials (glass units, metal frame, shading device etc) at both the construction and in-use stages through wholesale replacements.	A1-A5, B1-B6	Optimisation of the relationship between operational and embodied carbon. Fully glazed facades are avoided for the developments. Facades are designed to achieve lower U-value with less materials used.

No.	Principle	Description	Relevant life-cycle modules	WLC principles considered for the Proposed Development
11	Building life expectancy	Defining building life expectancy gives guidance to project teams as to the most efficient choices for materials and products. This aids overall resource efficiency, including cost efficiency and helps future-proof asset value.	A1-A5, B1-B5, C1-C4, D	Building life expectancy is considered 60 years.
12	Local sourcing	Sourcing local materials reduces transport distances and therefore supply chain lengths; and has associated local social and economic benefits, e.g. employment opportunities. It also has benefits for occupiers as replacement materials are easier to source. Transport type is also highly relevant. A product transported by ship will have significantly lower carbon emissions per mile than one sent by HGV. A close understanding of the supply chain and its transport processes is therefore essential when selecting materials and products.	A1-A5, B3-B5	Local sourcing of materials will be implemented to the Proposed Development.
13	Minimising waste	Waste represents unnecessary and avoidable carbon emissions. Buildings should be designed to minimise fabrication and construction waste, and to ease repair and replacement with minimum waste, which helps reduce initial and in-use costs. This can be achieved through the use of standard sizes of components and specification and by using modern methods of construction (MMC). Where waste is unavoidable, the designers should establish the suppliers' processes for disposal or preferably reuse or recycling of waste.	A1-A5, B1-B7, C1-C4, D	Modern construction methods will be employed, and the design has been developed in mind with disassembly and reuse in the future.

No.	Principle	Description	Relevant life-cycle modules	WLC principles considered for the Proposed Development
14	Efficient construction	Efficient construction methods (e.g. modular systems, precision manufacturing and MMC) can contribute to better build quality, reduce construction-phase waste and reduce the need for repairs in the post-completion and defects period (snagging). These methods can also enable future disassembly and reuse with associated future carbon savings.	A1-A5, B1-B7, C1-C4, D	Modular bathrooms and kitchens have been considered to streamline the construction and disassembly process.
15	Lightweight construction	Lightweight construction uses less material, which reduces the emissions of the building as there is less material to source, fabricate and deliver to site. Foundations can then also be reduced with parallel savings. Lightweight construction can also be easier to design for future disassembly and reuse. The benefits of lighter construction should be seen in the context of other principles such as durability.	A1-A5, C1-C4, D	Lightweight construction will be considered in the design process when calculating the load capacity.
16	Circular economy	The circular economy principle focuses on a more efficient use of materials which in turn leads to financial efficiency. Optimising recycled content, reuse and retrofit of existing buildings; and designing new buildings for easy disassembly, reuse and retrofit, and recycling as equivalent components for future reuse are essential. The use of composite materials and products can make future recycling difficult. Where such products are proposed, the supplier should be asked for a method statement for future disposal and recycling.	A1-A5, B1-B5, C1-C4, D	Future disassembly and materials with high potential for reuse and recycling have been considered, promoting a circular economy.

Table 4 - WLC Principles (Whole Life-cycle Carbon Assessments – London Plan Guidance)

3.4 Data Sources

The accuracy of the data used in the assessment is essential. Table 5 below summaries the data sources for the assessment.

- During the early design stage, when specific manufacturers have not yet been identified, appropriate generic carbon data from verified Type III Environmental Product Declarations (EPDs) should be applied as specified in WLC-LPG and RICS PS, Table 16.
- The material quantities are taken from the Revit model which was provided by the design team.
- As a structural engineer has not yet been appointed, the quantities for the substructure and framework have been estimated using the Revit model which was provided.
- For MEP equipment, quantity estimations follow the RICS MEP supplementary table and CIBSE TM65, as the project is still in early design and the specifications for MEP services have not yet been finalised.
- The energy consumption and associated energy carbon emissions are derived from the SAP report.

Further details can be found in Section 3.4 regarding model Inputs and Section 3.5 for assumptions applied.

Data Source	Discipline/Company	Description
Generic Materials	OneClick - LCA Software	OneClick generic database & EPD database
Cost Plan	N/A	N/A
Architectural Plans	London Placemaking	Architectural drawings, Revit model
Structural Engineering drawings	N/A	N/A
M&E drawings	N/A	N/A
Energy Strategy	N/A	N/A
Pre-Demolition audit	N/A	N/A

Table 5 - Data Sources for the WLCA

3.5 Modelling Inputs

The section elaborates on the building element categories, in line with 'RICS Whole Life Carbon Assessment for the Built Environment' (2nd Edition, November 2023). The building elements are based on the RICS NRM classification system level 3 sub-elements.

Building element group	Building element (NRM Level 3)	Scope notes
Demolition	0.1 Toxic/hazardous/contaminated material treatment	The information is not available at the early design stage. More information will be added to the assessment at a later stage.
	0.2 Major demolition works	There is no demolition on the site.
0 Facilitating works	0.3 and 0.5 Temporary/enabling works	It is assumed there are no facilitating works. The construction site impacts are included under A5 site operations.
	0.4 Specialist groundworks	As above.
1 Substructure	1.1 Foundations and piling	Pile foundation with footing foundation will be implemented for developments with heavy loads.
	1.2 Basement retaining walls and lowest slab	Basement retaining walls. Lowest floor slab: Concrete slab will be installed with reinforcement, insulation, vapour barrier membrane.
2 Superstructure	2.1 Frame	The frame will be concrete columns and beams.
	2.2 Upper floors	Concrete masonry units and precast concrete, PUR rigid insulation, concrete screed, sand, timber joists, metal decking, chipboard, vapour barrier membrane
	2.3 Roof	Aluminium standing seam roof cladding, Ready-mix concrete RC25/30 with CEM I cement, reinforcement steel 97% recycled content, polyethylene vapour barrier membrane, Kingspan Kooltherm K5 insulation, roof felt
	2.4 Stairs and ramps	Hardwood stairs, concrete stairs

Building element group	Building element (NRM Level 3)	Scope notes
	2.5 External envelope including roof finishes	Aluminium framed curtain wall system with 50% recycled aluminium, Brick wall (clay brick) and mortar with fibreglass insulation, cavity and concrete masonry blockwork. Retaining walls – precast concrete. Screed – on window areas. Balconies – aluminium railings and balconies, glass panels. Aluminium standing seam roof cladding, Kingspan Kooltherm K5 insulation, Ready-mix concrete C30/37 10% recycled binder, reinforcement steel 97% recycled content, waterproofing membrane.
	2.6 Windows and external doors	Timber framed windows, Aluminium framed windows, Aluminium skylights. Timber front doors.
	2.7 Internal walls	Concrete masonry units, gypsum plaster boards, internal timber joists.
	2.8 Internal doors	Wooden interior doors.
3 Finishes	3.1 Wall finishes	Floor – engineered wood flooring. Walls – plaster, plasterboard, paint finish. Ceiling – emulsion paint.
	3.2 Floor finishes	
	3.3 Ceiling finishes	
4 Fittings, Furnishings & Equipment (FF&E)	4 FFE – Building/Non-building related	Sofas, chairs, cabinets, bed frames, tables, drawers, kitchen units, WCs, washbasin, bath and shower units and waste bins have been included.
5 Mechanical, Electrical & Plumbing (MEP)	5.1 - 5.5 – MEP services building/Building related	ASHP
6 Prefabricated Buildings and Units	6 Prefabricated buildings and units	Nothing has been proposed for the current design.

Building element group	Building element (NRM Level 3)	Scope notes
7 Works to existing building	7.1 Works to existing building or alterations	There are no existing buildings on the site.
8 External Works	8.1 Roads, paths, pavings, surfaces fencing, railings, walls, external fixtures 8.2 Soft Landscape planting, irrigation 8.3 External drainage, external services, minor building works	External hard landscaping has been included.

Table 6 - RICS WLC Building Element Categories for the Proposed Development

Table 7 below provides detailed information for each lifecycle module and a description of the source of the information or the assumption made for each stage, as per RICS PS and LPG-WLCA.

Module	Description	Data Source/ Assumption
A1-A3 Product Stage	A1 – Raw material supply: This Stage considers the environmental impact of raw materials which includes, extraction from their natural source, transporting to factories, energy used and emissions released during both extraction and transportation. A2 – Transport: This stage focuses on the environmental impact associated with transporting raw materials from suppliers to the manufacturing facility. This impact arises from the emissions generated by the fuels consumed by the transportation vehicles.	At early design stage, the material quantities are measured based on the architecture's drawings and Revit models. Generic carbon data will be used based on RICS PS default specifications for main building materials, when manufacturer's data is unavailable.

Module	Description	Data Source/ Assumption
	A3 – Manufacturing: This stage captures the environmental impact of manufacturing, which includes the fuels/materials used by machines, as well as disposal of any waste generated during the production process.	
A4 Transport to Site	Captures the impacts associated with the transportation of the materials and components from the factory gate to and from the project site.	Due to the project being in the early design stage, transport scenarios outlined by RICS guidance have been utilised (0).
A5 Construction & Installation Process	A5.1 – Pre-construction demolition: Carbon impacts resulting from deconstruction/ demolition, transporting and disposal of waste as part of the main works to the existing scheme. A5.2 – Construction activities: Carbon impacts from any construction activities and installation processes on-site, including temporary works, energy consumption for site accommodation and use of plant, machinery and equipment. A5.3 – Waste & waste management: Carbon impacts from the production and transport of products that will be wasted, as well as any impacts associated with waste treatment	There is no pre-construction demolition on the site. Construction - emissions will be captured at the post-construction stage. However, to include at the early design stage, construction site emissions have been accounted for using the floor area of the proposed development. Waste figures are to be captured at the post-construction stage. However, RICS-assigned waste rates for typical materials are used to calculate the carbon impact.
B1 In-use emissions	B1.1 – Material emissions & removals: Non-energy related carbon removals/emissions arising from component during. B1.2 – Fugitive emissions: Accidental release of refrigerants from MEP equipment	The refrigerant leakage rate is based on CIBSE TM65 for VRF system Annual Leakage Rate – 9%, End of Life Recovery Rate – 97%

Module	Description	Data Source/ Assumption
B2 Maintenance	Accounts for the carbon impacts from any activities relating to maintenance processes, including cleaning, as well as any relevant products used and waste produced	Following the RICS and GLA WLCA guidance, B2 impacts can be assumed to be 10 kgCO ₂ e/m ² or 1% of modules A1-A5 to cover all building element categories, whichever is greater.
B3 Repair	Captures carbon impacts from all activities that relate to repair processes, and any products used and waste produced including impacts from production, transportation to and from site, and installation of the repaired items	The B3 impacts have been calculated using the software and can be assumed to be equivalent to 25% of B2 maintenance impacts and 10% of A1-A3 impacts of MEP equipment.
B4 Replacement	Accounts for any carbon impacts associated with the anticipated replacement of built asset components, including any impacts from the replacement including the production, transportation to site and installation of the replacement items as well as any losses during these processes, as well as any impacts associated with the removal and end-of-life treatment of replaced items	The carbon impacts have been determined using the software which utilises the expected lifespans for typical building elements/components as per the RICS (Appendix C).
B5 Refurbishment	Captures impacts from production, transport to site and installation of the components used for a change or refurbishment planned prior to project completion during in-use stage	There is no planned refurbishment during the study period.
B6 Operational Energy	Captures carbon emissions from all operational energy use by a building over its lifecycle	The unregulated and regulated energy is based on the SAP modelling results. The carbon emissions from the operational energy will directly come from the energy assessment. The carbon emission factors used align with those used in the energy strategy for the development.
B7 Operational Water	Capture carbon impacts related to water supply and wastewater treatment, as measured and/or predicted over the life cycle	The estimated water consumption has been taken from the Revit model. At this stage, assumed to be 110 Liters/person per day based on the Building regulations Part G.

Module	Description	Data Source/ Assumption
C1-C4 End-of-Life	C1 – Deconstruction/demolition impacts: The impacts arising from any on- or offsite deconstruction and demolition activities at the end of life of the asset, including any energy consumption for site accommodation and plant use C2 – Transport Impacts: carbon impacts associated with the transportation of material from deconstruction and demolition to the appropriate final location. C3 – Waste processing: Impacts associated with their preparation for reuse, waste treatment and recovery prior to reaching the end-of-waste state. C4 – Disposal: Impact of elements not expected to be reused, recycled or recovered, but intended for final disposal either in landfill or incineration.	All the end-of-life scenario are based on the default values and scenarios modelled within the OneClick to divert at least 95% of the waste away from landfill/incineration and achieve circularity.
D Benefits and loads beyond the system boundary	D1 - Net output flows from reuse recycling energy recovery other recovery D2 - Exported utilities, e.g. electric energy thermal energy potable water	D stage carbon emissions are based on the default values and scenarios modelled within the OneClick

Table 7 - RICS WLCA life cycle modules for the Proposed Development

3.6 Modelling Assumptions

Table 8 below outlines the assumptions that have been incorporated into the design.

Assumptions		
Substructure	Foundations: Concrete	Ready-mix concrete, C40/50, 15% cement replacement with fly ash
	Foundations: Reinforcement	Reinforcement steel (rebar), generic, 97% recycled content (typical)
	Lowest floor	Ready-mix concrete, C40/50, CIII/B, 2413 kg/m ³ , Viaduct (Tarmac), Reinforcement steel (rebar), generic, 97% recycled content, Filter fabric, PUR rigid insulation panels, Polyethylene vapour barrier membrane, cementitious floor levelling screed
Superstructure	Concrete frame	Ready-mix concrete, C40/50, 25% cement replacement with GGBS Reinforcement steel (rebar), generic, 97% recycled content
	External Wall	Precast concrete retaining wall, incl. reinforcement, Aluminium frame window system with double glazing, per m ² , 128.77 kg/unit, Concrete masonry unit, Brick wall, incl. mortar, Fiberglass insulation in batts, Aluminium balcony system, aluminium railings
	Windows and external doors	Timber framed windows, Aluminium framed windows, Aluminium skylights Timber front doors
	Upper Floors	Precast dense masonry blocks and precast concrete slabs, cementitious floor levelling screed, PUR rigid insulation panels, vapour proof membrane, timber joists
	Roof	Aluminium standing seam roof cladding, Kingspan Kooltherm K5 insulation, Ready-mix concrete C30/37 15% Cement replacement with fly ash, reinforcement steel 97% recycled content, waterproofing membrane for roof
	Stairs and ramps	Hardwood stairs, concrete stairs
	Internal walls and partitions	Concrete masonry unit, red brick average production, gypsum plasterboard, emulsion paint

Assumptions		
	Internal doors	Wooden interior doors
	Fittings, furnishings and equipment (FF&E)	Sofas, chairs, cabinets, bed frames, tables, kitchen units, WCs, washbasin, bath and shower units have been included
	Services (MEP)	ASHP
External works	Hard landscaping	Concrete pavement
Building Services	Refrigerant	R290 refrigerant is proposed Annual Discharge – 1 kg; Annual Leakage Rate – 9%, End of Life Recovery Rate – 97%
In-Use Emissions	Operational emissions	In the absence of further information, we have assumed 1,600 kWh per flat per year which is roughly equivalent to £400/£500 per year/ flat
Operational Water	Water Consumption	Residential – 105 litres/person per day based on the proposed water fittings as listed here: • WC's: All dual flush capacity 3/6 Litres or less • Kitchen taps flow rate: 8 l/min or less • Bathroom taps flow rate: 6 l/min or less • Bath capacity to overflow: 140 l or less • Showers flow rate: 8 l/min or less • Dishwasher consumption: 0.5 Litres per place setting or less • Washing machine consumption: 6 litres per kg dry load or less

Table 8 - WLCA Assumptions

3.7 Completeness of Assessment

The WLC assessment accounts for all building-related cost items associated with each element. A minimum of 95% of the capital cost allocated to each building element category should be accounted for at each stage of the assessment. Items excluded should each account for less than 1% of the total capital cost of that building element category.

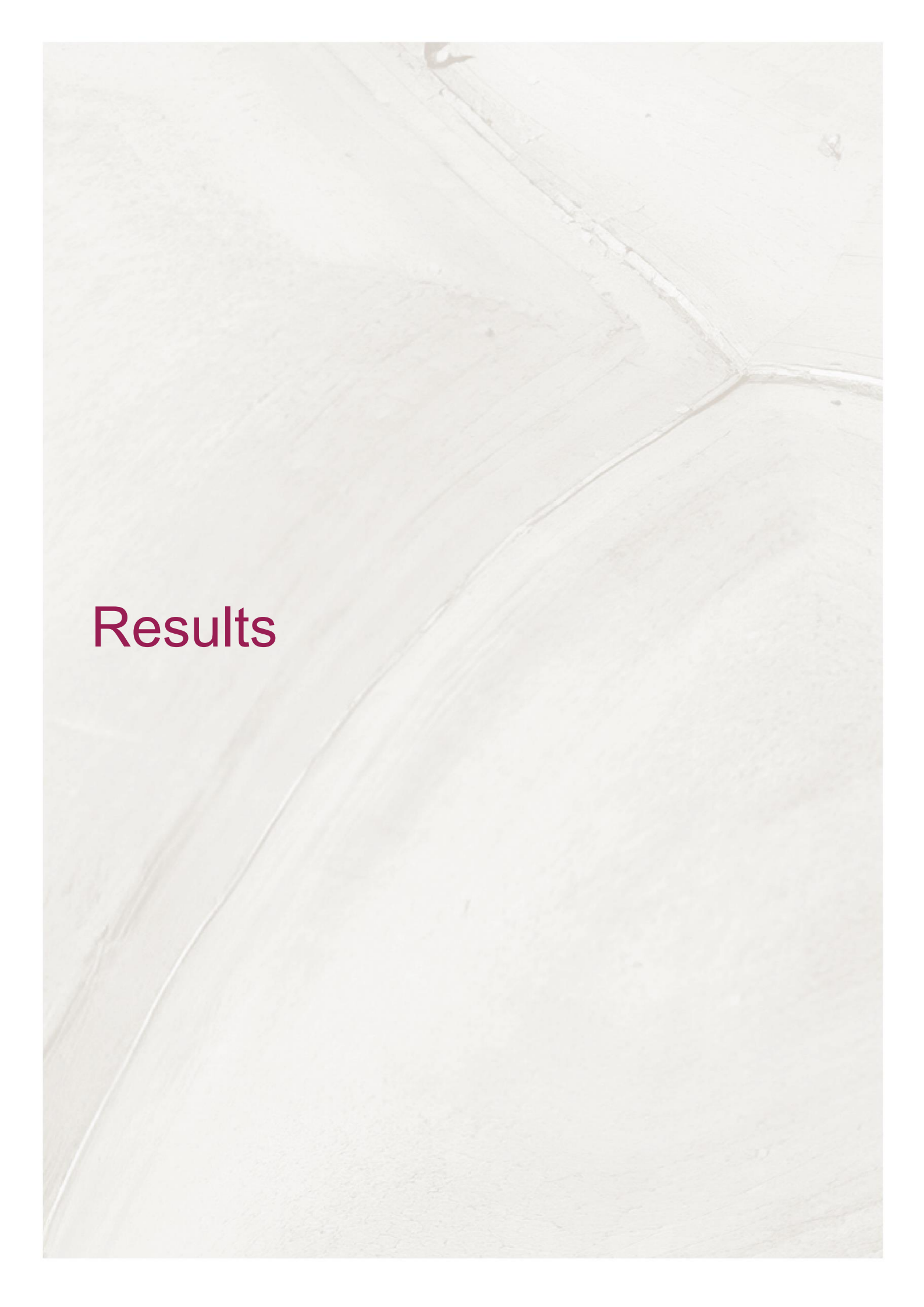
While the cost plan is currently unavailable, material quantities have been taken from the Revit model and drawings by the LCA consultant. Small material quantities for non-building-related elements are excluded, as their final specifications will be determined at a later stage. A contingency factor of 15% is applied to all elements and scenarios in the calculations.

The LCA model has been verified by a separate in-house LCA consultant, who reviewed the material quantities and selections.

All building elements set out in Table 9 below and all associated construction works are covered in the WLCA to ensure consistency of reporting, whatever the project phase. The elemental breakdown structure is derived from RICS' New rules of measurement (NRM), as discussed previously in section 3.5. Table 9 below summarise the coverage percentage of each element.

Building Element	Percentage Coverage
0 Facilitating works	100%
1 Substructure	100%
2 Superstructure	100%
3 Internal Finishes	100%
4 FFE	97%
5 Services	100%
6 Prefabricated buildings	100%
7 Work to existing buildings	N/A
8 External Works	97%
Average Coverage	98%

Table 9 - Building Element Coverage Percentage

An aerial photograph of a dry, cracked landscape. A winding road or path is visible, cutting through the parched, brownish-grey ground. The cracks in the earth form a complex network, suggesting severe drought or arid conditions. The overall tone is desaturated and somber.

Results

4.0 Results

The embodied carbon result encapsulates all lifecycle stages (A1-A5, B1-B5, C1-C4) excluding Modules B6-B7 (operational energy and water) and Module D (benefits beyond the proposed system). Operational carbon emissions are represented within Modules B6 (operational energy demand) and B7 (water demand). The total calculated WLCA result for the proposed development over the building's 60-year lifespan can be seen in Table 10 below.

Module	Lifecycle Embodied Carbon	Operational Carbon	Whole Lifecycle Carbon
A1-A5 Construction Process stage (kgCO ₂ e)	18,579,906		
B1-B5 Use Stage (kgCO ₂ e)	13,248,009		
B6-B7 Operational Demands (kgCO ₂ e)		38,188,890	
C1-C4 End of Life stage (kgCO ₂ e)	8,604,117		
Total Carbon Emissions (kgCO ₂ e) (excluding biogenic carbon)	32,987,284	38,188,890	
Biogenic Carbon (kgCO ₂ e)	-7,444,748		
Total Carbon Emissions (kgCO ₂ e) (including biogenic carbon)	40,432,032	38,188,890	

Table 10 - Whole Life Carbon result for the Proposed Development

Module	WLC benchmark (kg CO ₂ e/ m ² GIA)	Aspirational WLC benchmark (kg CO ₂ e/ m ² GIA)	Result for this development
A1-A5 (excluding sequestration/ biogenic carbon)	<850	<500	472
B1-B5, C1-C4 (excluding B6 & B7)	<350	<300	555
A-C (excluding B6 & B7, including sequestration)	<1200	<800	838

Table 11 - Comparison of results with the GLA WLCA benchmarks

It is worth noting that the emissions for stages B and C are slightly higher than the benchmark. However, the upfront carbon of the development is lower than both the WLC benchmark and the aspirational benchmark. Moreover, the overall WLC for Stages A-C is almost at the aspirational WLC level. The slightly high estimate for stages B and C is related to the uncertainty for these future stages.

4.1 Embodied Carbon

4.1.1 Contribution of CO₂e per lifecycle stage

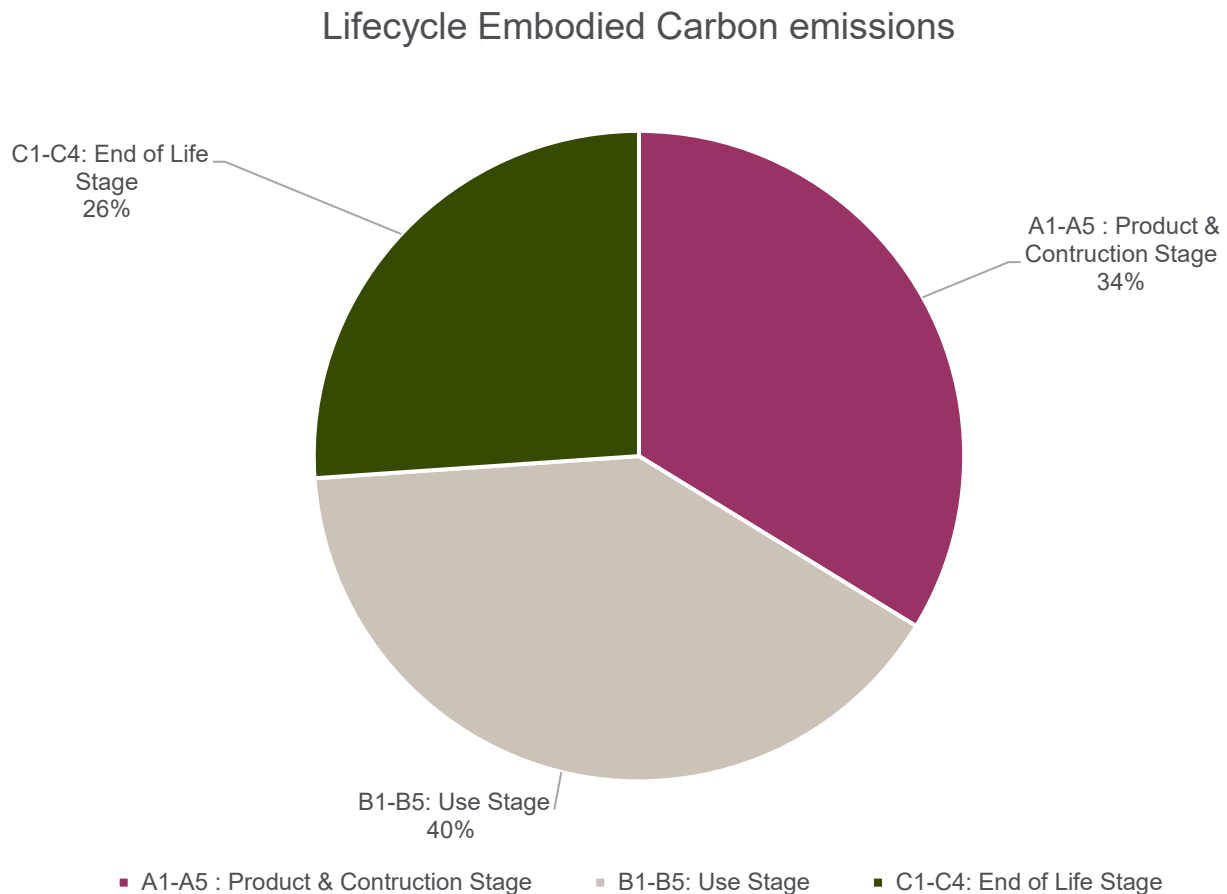


Figure 5 - Embodied Carbon emissions over lifecycle stages

Figure 5 above demonstrates that the carbon emissions associated with the use stage (B1-B5) is the highest followed by the product and construction stage (A1-A5). The emissions for lifecycle modules A1-A5 are based on the manufacture, transportation and installation of products on the site. The product and construction stages often have the highest carbon emissions associated with them.

Considering the above, the in-use phases for the proposed development provide significant room for improving the carbon performance of the building.

As the assessment has been undertaken early in the design stage, the project team can realign their detailed design and construction processes based on the carbon performance of the current design in order to deliver an even more sustainable development. This may include opting for more durable products which require less replacement and repair over the lifetime of the building to reduce the associated embodied carbon.

4.1.2 Contribution of carbon-intensive materials

In order to capture a more detailed picture of building material carbon emissions, a breakdown of the contribution of different building elements and materials to the overall carbon emissions for the proposed development is given below.

Whole Life Carbon Emissions by Classifications (kgCO₂e)

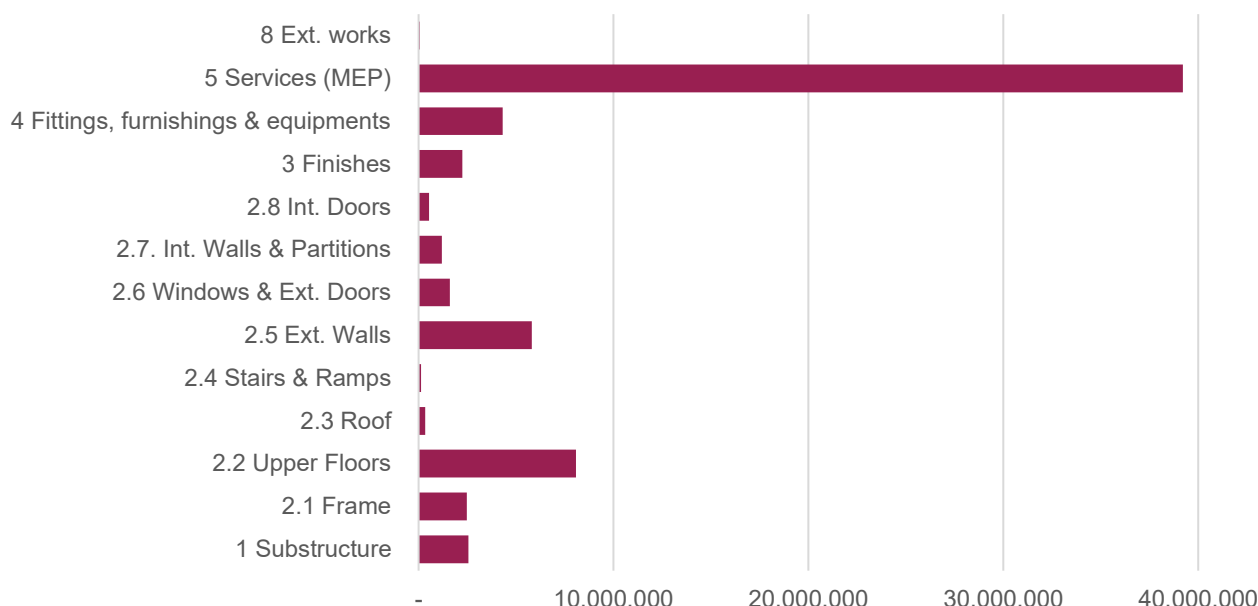


Figure 6 - Breakdown of the carbon emissions per building element

Figure 6 illustrates that the building element with the highest carbon emissions is the building services, which covers the operational energy of the building during its use. Since the assessment is conducted at the design stage, the actual carbon emissions from these activities depends on the assumptions discussed earlier in Section 3.5.

4.2 Operational Carbon – Energy

The energy consumptions and associated carbon emissions of the proposed development have been calculated based on each flat consuming approx. 1,600kWh per year.

4.3 Low-carbon options appraisal

The assessment has considered low-carbon alternatives for the options appraisal that might change the aspect of the design along with reduction of embodied carbon emissions. These options have been selected, taking into account the type of building and suitability of change, as shown in Table 12 below.

Option	Original design	tCO ₂ e	Actions included to reduce whole life-cycle carbon emissions	tCO ₂ e	% Improvement
1	Reinforcement steel generic, recycled content, (One Click LCA)	58	Reinforcement steel (rebar), generic, 97% recycled content (typical)	33	43%

Option	Original design	tCO ₂ e	Actions included to reduce whole life-cycle carbon emissions	tCO ₂ e	% Improvement
2	Aluminium cladding	3,237	Brick wall, incl. mortar	821	74%
3	Ready-mix concrete, normal-strength, generic, C40/50 (5800/7300 PSI), S1 XC0/XC1, 0% recycled binders in cement	4,696	Ready-mix concrete, C40/50, CIII/B, 2413 kg/m ³ , with improved embodied carbon	528	89%

Table 12 - Improvements to the design

Option	Baseline	tCO ₂ e	Further potential opportunities	tCO ₂ e	% Improvement
1	PUR rigid insulation panels	3,873	EPS insulation panels	887	77%
2	Concrete beams	2390	Steel beams	2235	7%
3	Steel front doors	614	Timber front doors	574	6.5%

Table 13 - Further potential opportunities to reduce carbon

Actions have been considered to demonstrate a reduction in carbon emissions, and have been integrated into the design. It is important for the design team to thoroughly evaluate and incorporate the options that prove the most effective in significantly reducing carbon emissions.

Figure 7 shows how the options chosen have contributed to a reduction in carbon emissions. The design options provide further potential opportunities for carbon reduction. The results from each design option have been compared with the design baseline to depict the percentage improvement. These results can be seen in Figure 8.

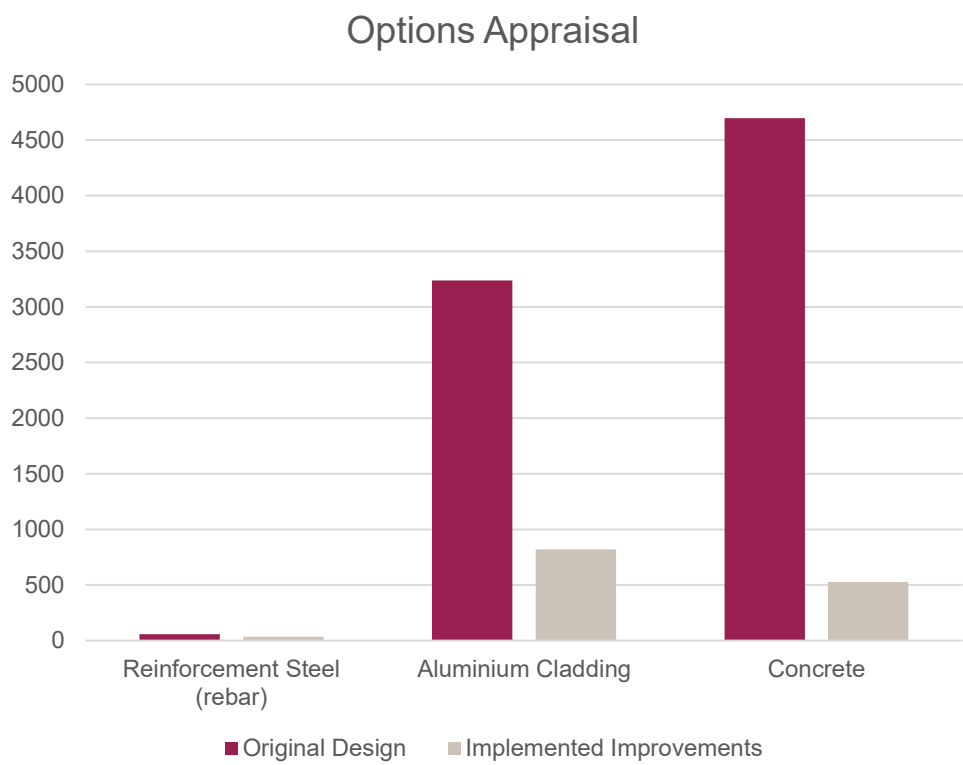


Figure 7 – Comparison of baseline vs Implemented options

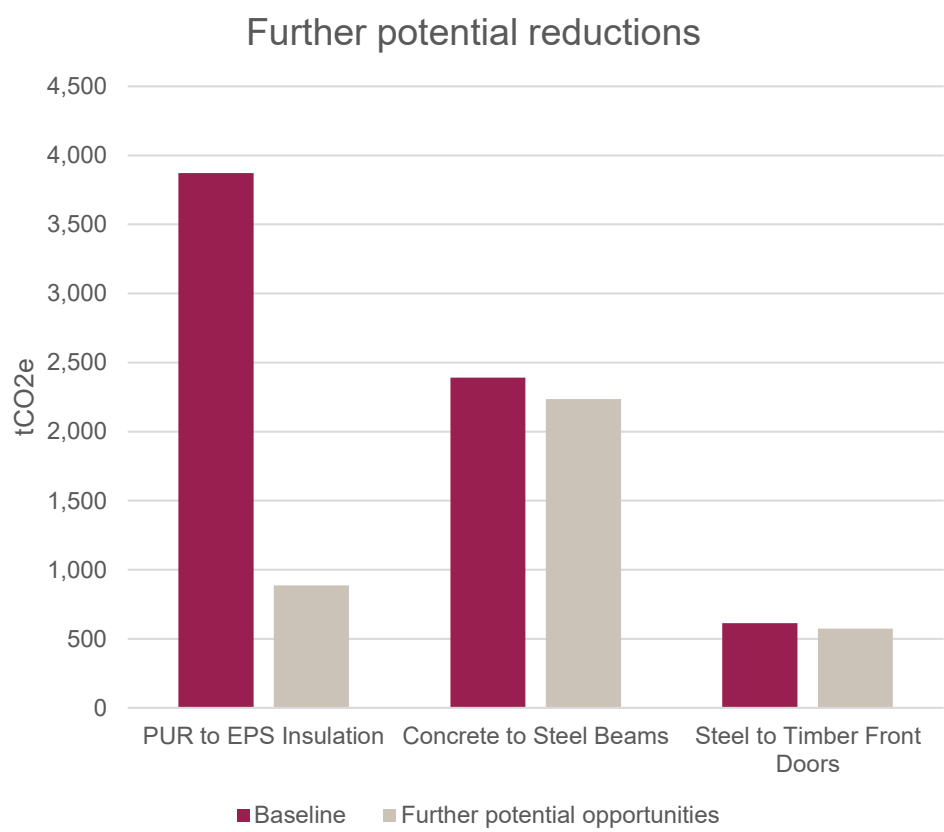


Figure 8 - Comparison of further potential opportunities

4.4 GLA Benchmarking

The WLC benchmarks specified are used as a guide when projects are urged to examine how they can reduce WLC emissions. A further set of aspirational WLC benchmarks have been developed which are based on a 40% reduction in WLC emissions compared to the first set of WLC benchmarks. This is founded on the World Green Building Council's target to achieve a 40% reduction in WLC emissions by 2030. As of now, modules B6, B7 and D have not been included in the benchmarks due to their variability in predicted and actual readings upon construction and use of the Proposed Development.

GLA benchmarks are calculated by assessing the carbon emissions the different lifecycle stages of a development against its gross internal floor area to highlight areas of carbon reduction/mitigation. The performance of the Proposed Development is displayed in Figure 99 below. The GLA benchmarks are achieved and the results are just slightly over the GLA aspirational benchmarks.

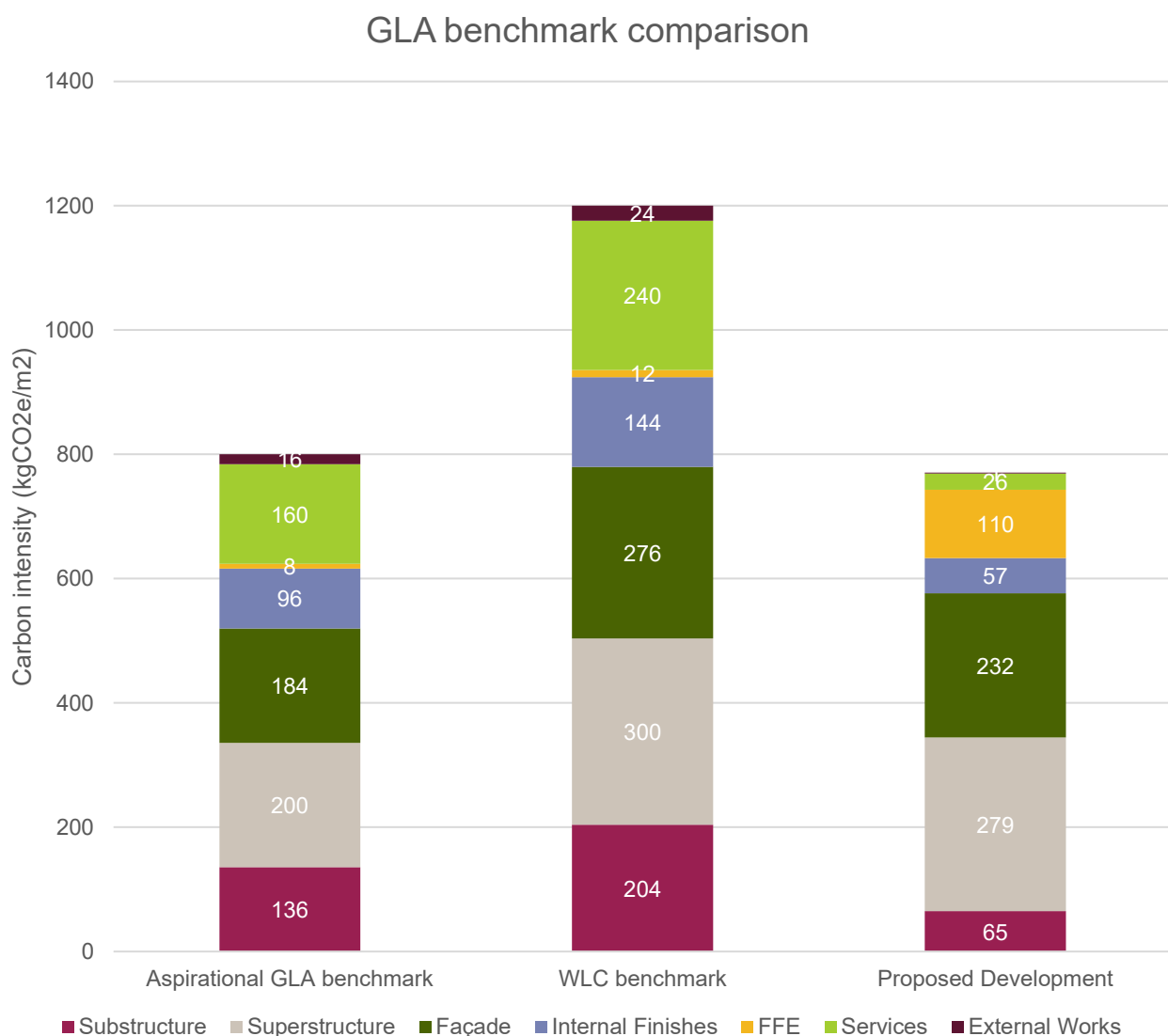
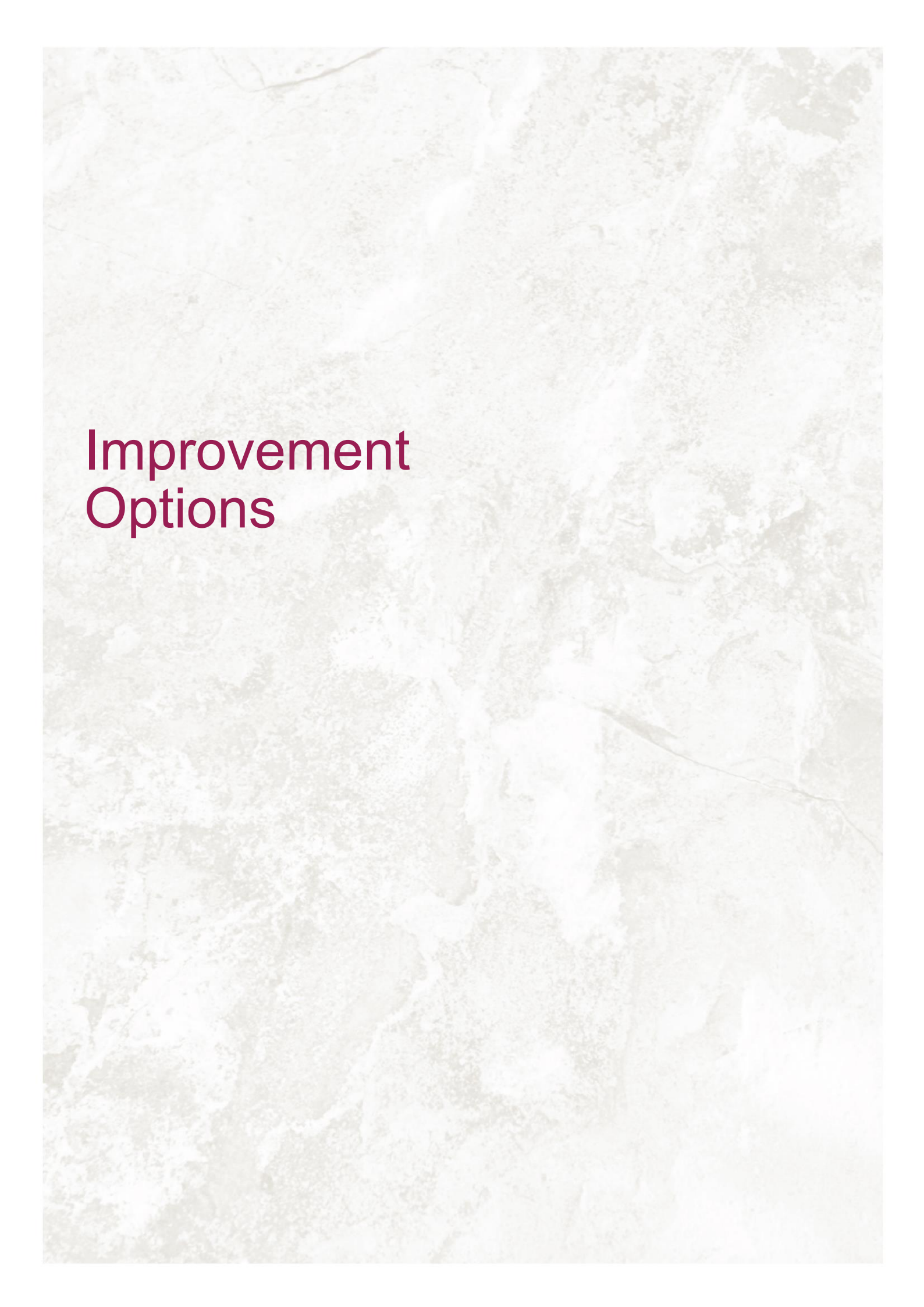


Figure 9 - Comparison of the Proposed Development's Carbon Emissions against GLA Residential Benchmarks

The background of the slide is a light-colored, marbled paper with a complex, organic pattern of veins and swirls in shades of cream, beige, and light brown. The texture appears slightly grainy and aged.

Improvement Options

5.0 Improvement Options

This section presents recommended opportunities on how to further reduce the proposed development's embodied carbon emissions. A series of improvement options have been identified during the current design stage which are subject to feasibility. The feasibility of the recommended improvement options should be analysed during the next design stages to assess implications on cost, programme as well as market availability and procurement options.

The following options are under consideration:

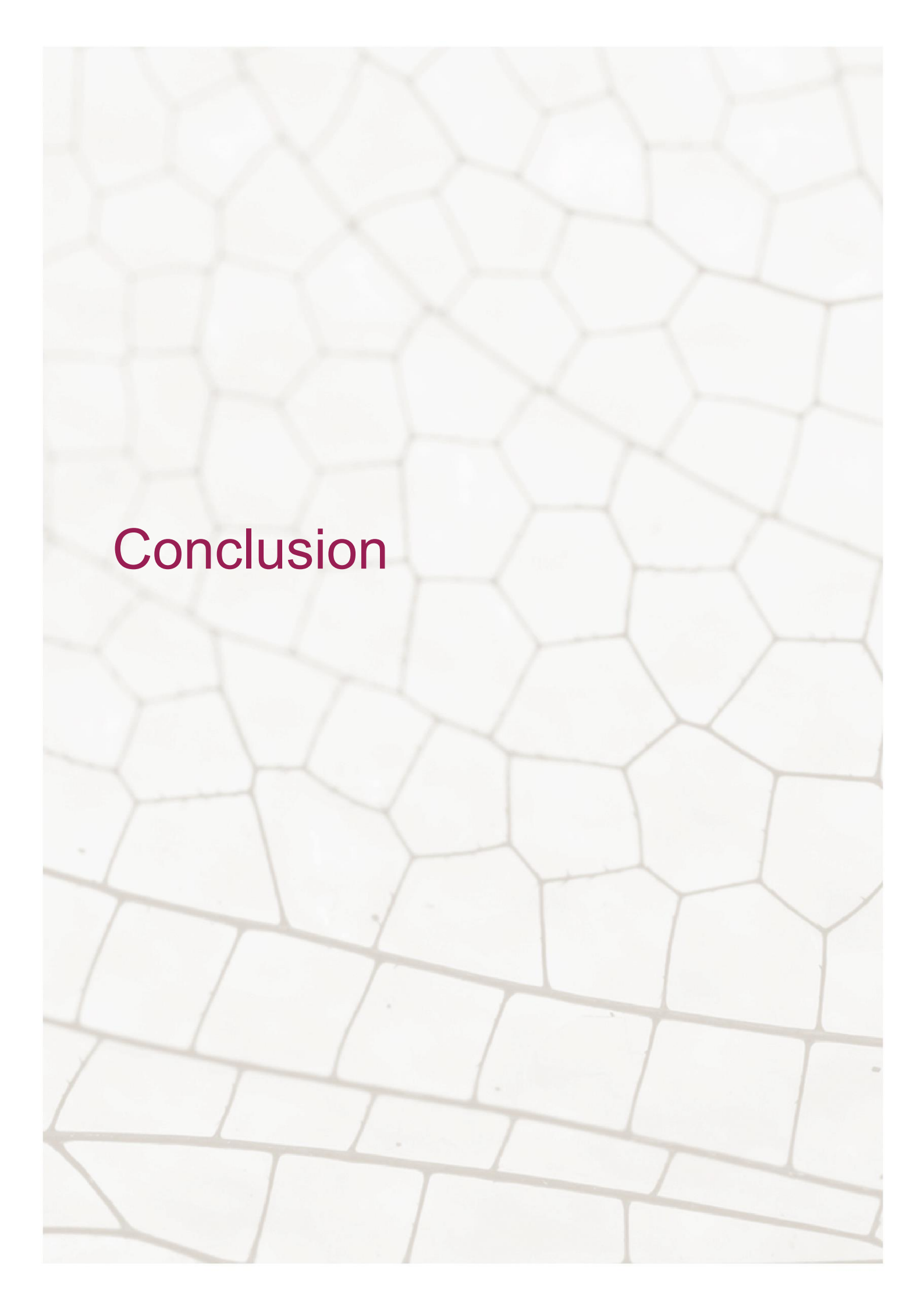
- Increasing the recycled content of the steel rebar in concrete elements of the building which would not compromise the structural integrity of the Proposed Development.
- Rebar specifications - As one of most contributing material, beyond quantity optimisation, low-carbon specification should be considered. Adopting a national EAF rebar manufactured with renewable energy could offer one of the biggest potential savings.
- Changing the door types from aluminium to wooden doors can bring down the carbon emissions associated with this building element.
- Changing the insulation type can reduce the carbon emissions associated with the proposed development.

To aid the tangibility of decarbonisation across the Proposed Development as it moves from design to construction, the following recommendations can be incorporated:

- The appointed Principal Contractor should endeavour to comply with the principles of a Sustainable Procurement Policy or provide their own similar policy, subject to review by the Applicant.
- The appointed Principal Contractor shall endeavour to source materials with valid EPDs and Responsible Sourcing Certification and gather documentation. The Principal Contractor shall endeavour to procure EPDs at the product level, or if unavailable, EPDs at the manufacturer/Organisational level, for all material types and categories.
- The Principal Contractor shall endeavour to procure materials with valid certification from BES 6001 (all), CARES (steel), FSC/PEFC/SFI (timber), or alternatively EMS (all), for all material types and categories.

Additionally, to support responsible sourcing of materials and services, the following websites can be extremely useful resources to gather organisational and product-level material EPD/Certification:

- **Global product EPDs** – [EPD Library | EPD International \(environdec.com\)](#)
- **Global product/Organisation Responsible sourcing certificates** – [Responsible Sourcing League Tables - BRE Group](#)
- **Global PEFC timber products** – [PEFC - Programme for the Endorsement of Forest Certification](#)
- **Global FSC timber products** – [FSC Certificates Public Dashboard](#)
- **Global product/Organisation Responsible sourcing certificates** – *Greenbook Live: BES 6001 The Framework Standard for Responsible Sourcing*

The background of the slide is a microscopic image of plant tissue, likely an endodermis. It shows a honeycomb-like pattern of cells. The cells in the upper portion are roughly hexagonal and have thin walls. The cells in the lower portion are more rectangular and have very thick, dark-stained corners, which are characteristic of cornuata cells. The word "Conclusion" is written in a dark red, serif font on the left side of the image.

Conclusion

6.0 Conclusion

The WLCA undertaken during the design stage has provided a baseline to establish a pathway to reduce the lifecycle emissions for Stoney Wood Quarter, Barnet. The assessment has identified carbon hotspots for the Proposed Development and suggested low carbon options that will help to reduce the embodied CO₂e emissions.

From Figure 9 above, the development passes the GLA's WLC guidelines established in the London Plan Guidance for WLCA. Residential benchmarks have been used to compare the carbon emissions, enabling the Proposed Development to pass the GLA's Baseline benchmark for lifecycle stage A-C.

The assessment determined the operational energy emissions based on the annual energy demand of the Proposed Development. The operational emissions have been considered for a non-decarbonised scenario as per the London Plan Guidance for WLCA.

As a result, the WLCA has been completed to support the 'London Plan Policy SI 2' and the planning application for the Proposed Development. In order to mitigate the CO₂e emissions, the Project team should consider the potential for materials with lower embodied carbon emissions and seek to incorporate sustainable construction practices.

Module	Lifecycle Embodied Carbon	Operational Carbon	Whole Lifecycle Carbon
A1-A5 Construction Process stage (kgCO ₂ e)	18,579,906		
B1-B5 Use Stage (kgCO ₂ e)	13,248,009		
B6-B7 Operational Demands (kgCO ₂ e)		38,188,890	
C1-C4 End of Life stage (kgCO ₂ e)	8,604,117		
Total Carbon Emissions (kgCO ₂ e) (excluding biogenic carbon)	40,432,032	38,188,890	
Biogenic Carbon (kgCO ₂ e)	-7,444,748		
Total Carbon Emissions (kgCO ₂ e) (including biogenic carbon)	32,987,284	38,188,890	71,176,174
D Benefits Beyond the System Boundary	-2,789,746		
Total Carbon Emissions (kgCO ₂ e) (including Module D)	30,197,538	38,188,890	68,386,428

Table 14 - Summary of the Whole Life cycle carbon emissions of the Proposed Development

Appendix

Appendix A - OneClick LCA Inputs

Class	Material	Quantity	Unit
Foundation	Ready-mix concrete, C40/50 XC2 XC4 XD2 XD3 XF3 XF4, CIII/B, 2413 kg/m3, Viaduct (Tarmac)	4803.56	m3
Foundation	Reinforcement steel (rebar), generic, 97% recycled content (typical), A615 (One Click LCA)	529214	kg
Foundation	Precast concrete retaining wall, incl. reinforcement, ep. 0.25m, C25/30 XC4 CEM II/A-S (SNBPE)	8535.46	m2
Beam	Polyethylene vapour barrier membrane, 0.15 mm, 0.14 kg/m2 (One Click LCA)	10704.67	m2
Beam	Rigid thermoset cellular insulation material faced on both sides with a glass tissue, L=0.21 W/mK, R=4.7619 m2K/W, 100 mm, 3.5 kg/m2, 35 kg/m3, Lambda=0.021 W/(m.K), Kooltherm K5 (Kingspan Insulation B.V.)	8553	m2
Beam	Aluminum standing seam roof and wall cladding with insulation, 0.19 W/mK, 1 mm aluminum plate, 200 mm stone wool 14.27 kg/m3 (Kalzip)	10357.1	m2
Beam	Ready-mix concrete, normal-strength, generic, C30/37 (4400/5400 PSI), 10% (typical) recycled binders in cement (300 kg/m3 / 18.72 lbs/ft3) (One Click LCA)	10010.84	m2
Beam	Reinforcement steel (rebar), generic, 90% recycled content, A615 (One Click LCA)	288360.4	kg
Beam	In-situ concrete slab assembly	9661	m2
Beam	Steel purlins and framing, 7850 kg/m3 (Voestalpine Metsec plc)	1451.1	kg
Beam	Membrane, waterproofing, for roofs, multilayer, 1.5-2.0 mm, 2x15/20 m, 2.35 kg/m2, Sarnafil TG 76 Felt PS (Sika)	10002.67	m2
Beam	Precast concrete floor slab, 117.63 kg/m2 (CENTRE D'ETUDES ET DE RECHERCHES DE L'INDUSTRIE DU BÉTON)	43873.4	m2
Beam	Sand (One Click LCA)	483631	kg

Class	Material	Quantity	Unit
Beam	Weber floor smoothing screed, 5-50mm layer thickness, 34 kg/m2, vetonit 130 Core (weber.)	18617.58	m2
Beam	Reinforcement mesh fabric (glass fibre), 0.16kg/m2, R131 (ADFORS)	9.7723	m3
Beam	Stone wool (mineral wool) insulation, unfaced, L = 0.0315 W/mK, R = 1 m2K/W, 31.5mm, 1.26 kg/m2, 40 kg/m3, (Range: 36-50kg/m3), 22% slag content (One Click LCA)	32580.75	m2
Beam	Plywood, generic, 4-50 mm (0.16-1.97 in), 620 kg/m3 (38.7 lbs/ft3) (One Click LCA)	18617.58	m2
Beam	Dried lumber from spruce or pine wood, 474 kg/m3, moisture content 18 % (Puutuoteteollisuus)	5015.983	m2
Beam	Planed timber, conifer (Treindustrien)	4654.393	m2
Beam	Gypsum plaster board, regular, generic, 6.5-25 mm (0.25-0.98 in), 10.725 kg/m2 (2.20 lbs/ft2) (for 12.5 mm/0.49 in), 858 kg/m3 (53.6 lbs/ft3), 0% recycled gypsum (One Click LCA)	18617.58	m2
Beam	Glass wool insulation in bats or rolls, unfaced, L = 0.035 W/mK, R = 2.86 m2K/W, 100 mm, 2.75 kg/m2, 27.5 kg/m3, (Range: 20-35kg/m3), 50% recycled glass content (One Click LCA)	9063.11	m2
Beam	Ready-mix concrete, normal-strength, generic, C30/37 (4400/5400 PSI), S1 XC0/XC1, 0% recycled binders in cement (min cem. content: 280 kg/m3 / 18.72 lbs/ft3), Portland cement CEM I 42.5 (One Click LCA (2024))	9063.11	m2
Beam	Reinforcement steel (rebar), generic, 80% recycled content, A615 (One Click LCA)	160508.1	kg
Beam	Finishing wall mortars, French average, 3 mm, 4.2 kg/m2, Mortiers de ragréage muraux (DONNEE ENVIRONNEMENTALE GENERIQUE PAR DEFAULT)	126883.96	kg
Beam	Steel sheets, generic, 90% recycled content (typical), S235, S275 and S355 (One Click LCA)	1687.07	kg
Beam	Chipboard, 690.85 kg/m3, thickness=8-38 mm, width=1830-2500 mm, length=1220-5600 mm (AB Klaipėdos mediena)	18617.58	m2
Beam	Vapour-proof membrane, 0.15 mm, 140 g/m2, Dampsperre 15 (Baca Plastindustri)	44725	m2

Class	Material	Quantity	Unit
Beam	Ready-mix concrete, RC 32/40 (32/40 MPa), 15% Cement replacement with fly ash	10357	m2
Beam	Self-levelling screed, 1 mm, 2.25 kg/m2, Gyvlon® EXCELIO (Anhydritec)	2754.1	m3
Column	Ready-mix concrete, C40/50 XC2 XC4 XD2 XD3 XF3 XF4, CIII/B, 2413 kg/m3, Viaduct (Tarmac)	9426648	kg
Column	Reinforcement steel (rebar), generic, 97% recycled content (typical), A615 (One Click LCA)	1195846.4	kg
Door	Aluminium framed fixed glass skylight, triple glazed, 0% recycled aluminium, 1.2 x 1.2 m, 59.7 kg/m2, 1.44 m2/unit (One Click LCA)	30.74	m2
Door	Stainless steel door handle, 1.69 kg/unit (ASSA ABLOY)	56.62	m2
Door	Grey cast iron part, EN15804+A1, ref. year 2018	0.93	m2
Door	Aluminium frame window double-glazed, operable(tilt and turn), 50% recycled aluminium, 1.48 m x 2.18 m, 25.3 kg/m2 (One Click LCA)	21151.488	m2
Door	Internal wooden doorleaf, fire resistant, 1.981x0.838 m, 17.9 kg/m2 (JELD-WEN)	880	m2
Door	External wood door (One Click LCA)	440	m2
External Wall	Aluminium frame window system with double glazing, per m2, 128.77 kg/unit, 2300 mm x 2180 mm, Coulissant Luméal PF 2 rails 2 vtx GA (Hydro Building Systems)	8489.8	m2
External Wall	Concrete masonry unit with cement-free binder, 100 mm, 153.8 kg/m2	56703.55	m2
External Wall	Fiberglass insulation in batts, faced, R-5.68 (Rsi=1 m2K/W), 1.416 kg/m2, Unfaced Fiberglass, Kraft Faced Fiberglass, Panel Deck FSK-25, FSK-25, ComfortTherm®, Cavity-SHIELD™ (Johns Manville)	56703.55	m2
External Wall	Aluminium balcony system, 3300 x 1800 mm, 595 kg/unit, Cobalt Hybrid Balcony (Blue Chyp Ltd, Cradley Heath plant)	0.88	kg

Class	Material	Quantity	Unit
External Wall	Free standing aluminium railing, 48 mm, 11 kg/m ² (GLASSLINE GmbH)	120.84	m ³
External Wall	Cement mortar (One Click LCA)	2961210	kg
Finish	Clay plaster, gross density 900.0 kg/m ³ , dry density 1600 kg/m ³ , EN15804+A1, ref. year 2018	145573.67	m ²
Finish	Rendering mortar – normal / finishing render, 1550 kg/m ³ (quick-mix)	56703.55	m ²
Finish	Weather resistant coating for exterior walls, 1.290 kg/l, 0.161 kg/m ² (AkzoNobel Decorative Paints)	350000	m ²
Finish	Acrylic water-based decorative emulsions for interior wall or ceiling surface, 0.1184 kg/m ² , Flat Matt XD (COAT paints)	59018.59	m ²
Finish	Hardwood	110.81	m ³
Finish	Multi-layered engineered wood flooring, 13 mm, 7.01 kg/m ² , 539 kg/m ³ (Parador)	24787	m ²
Finish	Emulsion matt paint for allround interior use, Pigment: Lightfast Pigments, binder: PVA Copolymer emulsion , solvent: Water, 1.443 kg/l, 18m ² /l, 0.16 kg/m ² , Supermatt White, Almond White, Gardenia, Magnolia, Light Base, Medium Base (Dulux Trade)	55076	m ²
Finish	Carpet tile, 0.23-0.28 in (5.85-7.15 mm), 0.5 x 0.5 m, 4.12 kg/m ² , Inline (Forbo Flooring B.V.)	24787	m ²
Finish	Single glass pane - no frame, 1 mm	0.31	m ³
Internal Wall	Tile adhesive, all round, for ceramics, 1-5 mm, 1400 kg/m ³	24.55	m ²
Internal Wall	Granite for interior and exterior coating of pavements, floors, walls and facades, 30 mm, 2671 kg/m ³	24.55	m ²
Internal Wall	Finishing wall mortars, French average, 3 mm, 4.2 kg/m ²	28,052	m ²
Internal Wall	Concrete masonry unit (CMU), 198 kg/m ² , Synerg·Eco	14026	m ²

Class	Material	Quantity	Unit
Internal Wall	Planed timber, conifer	4164.40	m2
Internal Wall	Glass wool insulation in bats or rolls, unfaced, L = 0.035 W/mK, 100 mm, 2.75 kg/m ² , 50% recycled glass content	31735.6	m2
Internal Wall	Oriented strand board (OSB), 8-30 mm	181.42	m2
Internal Wall	Adaptable walls with fabric-coated panels, 5m x 2.9m, 27 kg/unit, Adaptable Walls	10	Units
Internal Wall	Gypsum plaster board, regular, 50% recycled gypsum, 6.5-25 mm	71800	m2
Staircase	Concrete staircase, U-shaped, with no flat landing, width 140cm, 1928.2kg (CERIB)	500	ton
Ff&E	Three-seat sofa without armrest, H: 790 mm, D: 680 mm, W: 1710 mm, 24 kg/unit (One Click LCA)	688	unit
Ff&E	Chair, 6.37 kg/unit, Alf chair (MARK Product)	2336	unit
Ff&E	Acrylic bath and shower tub, EN15804+A1, ref. year 2018	78000	kg
Ff&E	Wooden cabinet, 73.05 kg/unit, Cabinet, MFC, COMBO, 2 levels w/hinged doors + 1 level open room (Scan Sørli)	1323	unit
Ff&E	Particleboard double bed frame, 1390 x 1950 mm, 77.8 kg/unit, DOUBLE BED FRAME (Bisley)	1097	unit
Ff&E	Oak table, 10 kg/unit, Arris table/oak (MARK Product)	1855	unit
Ff&E	Wooden chair, 8.64 kg/unit, OVO Chair (Benchmark)	632	unit
Roof	Rigid thermoset cellular insulation material faced on both sides with a glass tissue, L=0.21 W/mK, R=4.7619 m ² K/W, 100 mm, 3.5 kg/m ² , 35 kg/m ³ , Lambda=0.021 W/(m.K), Kooltherm K5 (Kingspan Insulation B.V.)	1798.77	m2
Roof	Pitched steel roof	6.34	m2

Class	Material	Quantity	Unit
Roof	Ready-mix concrete, RC25/30 with CEM I cement	347.67	m2
Roof	In-situ concrete slab assembly	347.67	m2
Site	Aggregate (crushed gravel), generic, dry bulk density, 1600 kg/m3 (One Click LCA)	6191	m2
Site	Galvanized steel bicycle shelters, 76.7 kg/unit, Abri-vélo [1 vélo] (DONNEE ENVIRONNEMENTALE GENERIQUE PAR DEFAULT)	8	unit
Site	Concrete stone pavement, stone thickness 50 mm (2 in)	6191	m2
Site	Ready-mix concrete, normal-strength, generic, C30/37 (4400/5400 PSI), 10% (typical) recycled binders in cement (300 kg/m3 / 18.72 lbs/ft3) (One Click LCA)	309.55	m3
Slab	Cementitious floor leveling screed, 10-250 mm, 1.8 kg/m2/mm, 1.6–1.8 kg/l, webervetonit 6000 Rapid Screed (Saint-Gobain Finland Oy)	64500.76	m2
Slab	Precast dense concrete masonry blocks, 190 kg/m2 (Mineral Products Association)	559.92	m2
Slab	Precast concrete beams and columns, steel reinforced	291.68	m2
Slab	Toughened glass - no frame, 1 mm, ex frame	49.92	m2
Slab	PUR rigid insulation panels with aluminium foil, paper and PET facing, R=7.4 m2K/W, L=0.022 W/mK, 160 mm, 5.73 kg/m2, Lambda=0.022 W/(m.K), EFITOIT® 160 mm (SOPREMA SAS)	63659	m2
Slab	Sand cleanliness per GFA, EN15804 A1/A2	7164.91	m2
Slab	Floor slab, timber joists, P2 R30 (1...2 krs.) (Large school), incl. One Click LCA generic data	18617.58	m2
Slab	Concrete in situ or Precast Concrete Assembly, incl. Glass Wool Insulation, for South Europe	9063.11	m2

Class	Material	Quantity	Unit
Slab	Metal-concrete composite decking, 130mm depth, C 30/37, included: sheet metal decking, rebar, steel beams and columns share per m2	22.14	m2
Systems	Wooden lockers and cupboards, 58.1 kg/unit (Bisley)	231	unit
Systems	Air/water heat pump for tertiary buildings for hot water production, reversible, 389 kg/unit, CAHV-R450YA-HPB (MITSUBISHI ELECTRIC B.V. FRANCE)	140	unit
Systems	Wooden wardrobe, 72.9 kg/unit (Bisley)	788	unit
Systems	TV socket, 0.05 kg/unit (One Click LCA)	523	unit
Systems	Ceramic toilet with flush tank (cistern), 34.8 kg/unit, 980 × 360 × 430 mm (One Click LCA)	578	unit
Systems	Waste container for commercial use, H:1340 mm, D:1090 mm, W:1200 mm, 50 kg/unit, 1000 L (One Click LCA)	144	unit
Systems	Ceramic bathroom washbasin, 16.7 kg/unit, 850 × 460 × 150 mm (One Click LCA)	574	ton

Appendix B - RICS Transportation Values

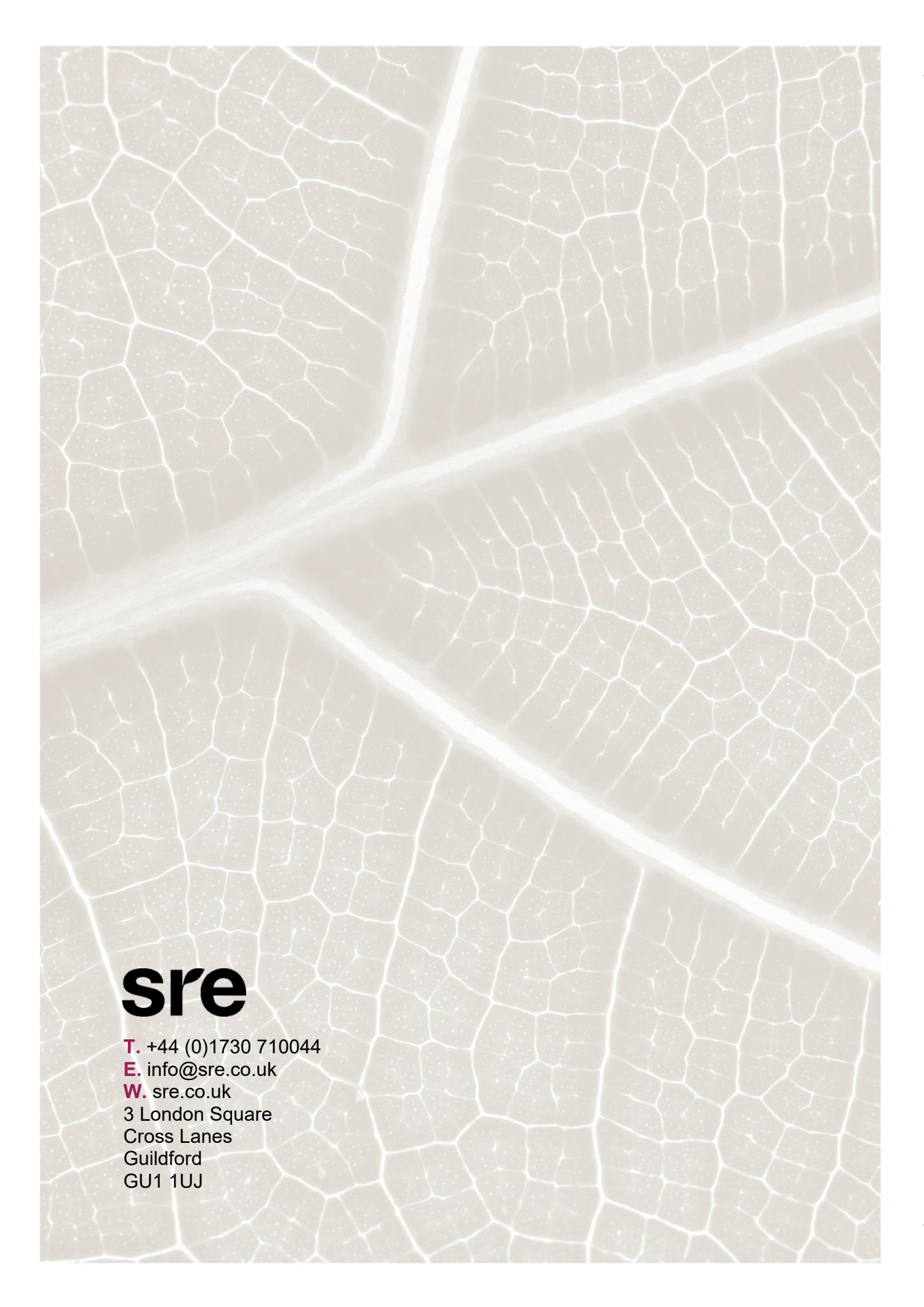
Transport Scenario (both road and sea to be used)	km by road*	km by sea**
Locally manufacturer (ready-mix concrete)	20	-
Locally manufactured (general) e.g. aggregate, earth, asphalt	50	-
Regionally manufactured e.g. plasterboard, blockwork, insulation, carpet, carpet, glass	80	-
Nationally manufactured e.g. structural timber, structural steelwork, reinforcement, precast concrete	120	-
European manufacturers e.g. Cross Laminated Timber (CLT), façade modules	1,500	100
Globally manufactured e.g., specialist stone cladding	500	10,000
* Means of transport assumed as average of all average rigid HGVs or other road vehicles where details available (average laden) ** Means of transport assumed as average container ship		

Appendix C - RICS Material Replacement Values

Building Part	Building Elements/Components	Expected Lifespan
Substructure	Piling and foundations	60 years (or building lifespan)
	Lowest ground floor	
Superstructure: frame, upper floor and roof structure	Structural elements, e.g. columns, walls, beams, upper floor and roof structure	60 years (or building lifespan)
Facade	Opaque modular cladding	
	Rains screens, timber panels	30 years
	Brick, stone, block and precast concrete panels	60 years
	Glazed cladded/ curtain walling	35 years
	Windows and external doors	30 years
	Hardwood/steel/aluminium windows	
	Doors	20 years
Roof	Roof Covering	
	Single-ply membrane	30 years
	Standing seam metal	30 years
	Tiles, clay and concrete	60 years
Superstructure	Internal Partitioning and dry lining	
	Stud work	30 years
	Blockwork	60 years
Finishes	Wall Finishes: Render/paint	30/5 years

Building Part	Building Elements/Components	Expected Lifespan
	Floor Finishes	
	Carpet/Vinyl	7 years
	Stone tiles	25 years
	Raised access floor (RAF) pedestal/tile	50/30 years
	Ceiling Finishes	
	Substrate/paint	10 years
	Suspended grid (ceiling system)	25 years
FF&E	Loose furniture and fittings	10 years
Services/MEP	Heat Source e.g. boilers, calorifiers	20 years
	Heat source, e.g. heat pumps (except ground source)	15 years (20 years)
	Space heating and air treatment	20 years
	Central cooling systems (cooling only) e.g. fan coil systems, variable air volume, variable refrigerant volume	15 years
	Ductwork	
	Galvanised	40 years
	Plastic or flexible	15 years
	Electrical installations	30 years
	Lighting fittings	15 years
	Communications installations and controls	15 years
	Water and disposal installations	25 years
	Rainwater harvesting and grey water collection	30 years

Building Part	Building Elements/Components	Expected Lifespan
	Sanitaryware	20 years
	Lift and conveyor installations	20 years
Hard Landscaping	Asphalt	35 years
	Concrete and stone paving	60 years
	Timber decking	15 years

The background of the entire page is a grayscale, high-magnification microscopic image of plant tissue. It shows a network of large, irregular cells with prominent, light-colored cell walls. Several thick, white, vein-like structures (vascular bundles) run diagonally across the field of view, separating the cellular regions.

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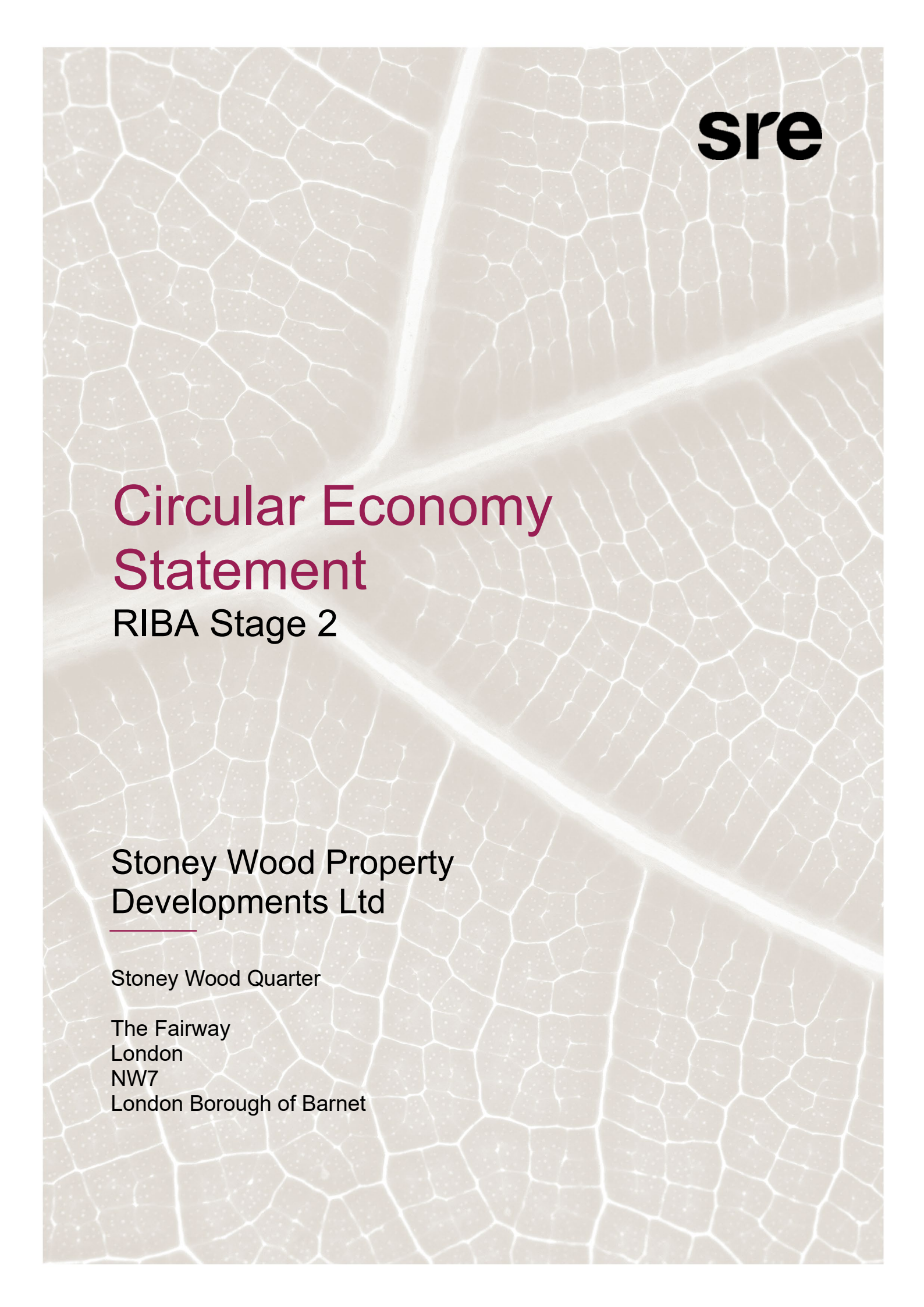
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Circular Economy Statement

RIBA Stage 2

**Stoney Wood Property
Developments Ltd**

Stoney Wood Quarter

The Fairway
London
NW7
London Borough of Barnet

Version	Revision	Date	Author	Reviewer	Project Manager
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The background of the slide is a microscopic image of plant tissue, likely from a leaf. It shows a network of cells with thickened corners, characteristic of cornuata cells. The cells are arranged in a somewhat regular pattern, with some larger cells and some smaller ones. The overall color is a light beige or cream, with the cell walls appearing slightly darker.

Introduction

1.0 Introduction

This Circular Economy (CE) Statement has been prepared by SRE on behalf of Stoney Wood Property Developments Ltd (The Client) to demonstrate the sustainability measures incorporated into the design of the redevelopment at Stoney Wood Quarter, Barnet (The Proposed Development). With aims of satisfying London Plan policies GG5 and SI7 and the Greater London Authority March 2022 guidance, the Circular Economy Assessment outlines how the adoption of Circular Economy principles throughout the design, demolition, construction, operation, and end-of-life phases of the Proposed Development has been considered at all stages of the Proposed Development's life cycle.

The figures within this report may be based on indicative modelling and an assumed specification outlined within the relevant sections. Therefore, this modelling may not represent the as built emission or energy use of the Proposed Development and further modelling may need to be undertaken at detailed design stage to confirm precise performance figures. Please contact SRE should you have any questions, or should you wish further modelling to be undertaken post planning.

1.1 The Site and Proposed Development

The Proposed Development is for *“Redevelopment of the site for use as residential (Class C3), in new buildings up to ground plus 5 storeys. Ancillary flexible (Class E) uses at ground floor level. Together with plant, play space, car and cycle parking, hard and soft landscaping and all other works associated with the development”*.

The Site is located on the northern side of the Fairway in the north of the London Borough of Barnet. It is to the east of the M1 and west of Barnet Way.

The Site is approximately 17,600 sqm in size and has no prevailing or dominant architectural style north of the Fairway, typology or local context. It is highly varied and the housing development which surrounds it is wedged between the M1 and Thameslink/Midland Mainline to the west and the A1 Barnet Way to the east. The south is dominated by a variety of interwar “metroland” semi-detached houses. There are flats and maisonettes located within the area in addition to larger family homes.

The site is bounded by Fairway and Northway School to the east and Stoney Wood woodland to the west which merges into Mill Hill Golf Course north and northeast of the Site. To the south of the Site is residential, with detached and semi-detached dwellings situated on large plots with front and rear gardens.

Figure 1 demonstrates the location of the Proposed Development. The Site Plan for the Proposed Development is shown in Appendix A.



Figure 1 - Location of the Proposed Development (Google Maps)

The Proposed Development will aim to deliver lower energy and water use, lower carbon emissions and lower operational costs than a Building Regulations Compliant design through a 'fabric first' approach to the building design, in line with best practice. The site will also be assessed in accordance with the RICS 'Whole Life Carbon Assessment for the Built Environment', and will incorporate Circular Economy principles within the overall design, procurement, and construction process, following the March 2022 Greater London Authority (GLA) Circular Economy guidance¹ as a methodology.

In advance of the submission of the full planning application, this Circular Economy Statement was prepared by SRE and reviewed by the Design Team within a Circular Economy workshop held on 8th May 2025. Written and verbal feedback was received, which has been taken into consideration in the preparation of the final Circular Economy Statement. Post-meeting notes from this workshop can be found in Appendix B.

The following strategic approach is to be adopted at each key development phase, as shown in Table 1.

¹ Mayor of London, London Plan Guidance-Circular Economy Statements, March 2022. Available at: <https://tinyurl.com/yckx9akr>

Aspect	Phase	Steering Approach	Explanation	Target	Supporting Analysis/ Studies/ Audits
Circular Economy Approach for the existing site	Demolition	No demolition will occur on-site.	-	-	-
Circular Economy Approach for the Proposed Development	Design	Reduction of carbon emissions and development of a flexible and durable building.	Reduction of Carbon Emissions through material selection and the undertaking of a whole life carbon assessment to clarify likely carbon output.	<850 kgCO ₂ e/m ² (modules A1-A5) GLA benchmark (Residential)	WLCA Study – Indicative materials carbon quantification shows 472 kgCO ₂ e/m ² (modules A1-A5)
	Design	Building in Layers Approach to provide robust design built for longevity.	Building in Layers Assessment to confirm approach to material selection in line with the Building in Layers methodology.	Justification for the materials selection in line with the methodology.	Building in Layers Appraisal – included within Section 5. One Click output has confirmed a circularity performance of 31% for the Proposed Development.
	Construction	Reduction in on-site emissions.	Reducing impacts to the local and global environment through the limiting, reporting and targeting of emissions and waste production and a robust site policy process.	>95% of non-demolition waste from site diverted from landfill. Energy and water use to be monitored on site with appropriate targets set. Waste to be minimised and diverted from landfill.	Resource Management Plan is to outline all site requirements with regards to energy, water and waste.
Circular Economy Approach for municipal waste during operation	Operation	Enhance the ability of building occupiers to increase recycling rates.	Facilitate the easy and convenient segregation of waste by building users for the operational phase of the building.	The scheme is to target >65% for municipal waste with an aspirational target >75%.	Correctly sized, located and labelled bins to be provided as an iceberg bin system.

Table 1 - Circular Economy Strategy Approach

Pre-redevelopment Audit

In accordance with the GLA Circular Economy Principles, to assess the Proposed Development, the strategic CE approach must follow the methodology of the 'existing structures/buildings' Decision Tree, as shown in Figure 2, and for 'New Construction', as shown in Figure 3.

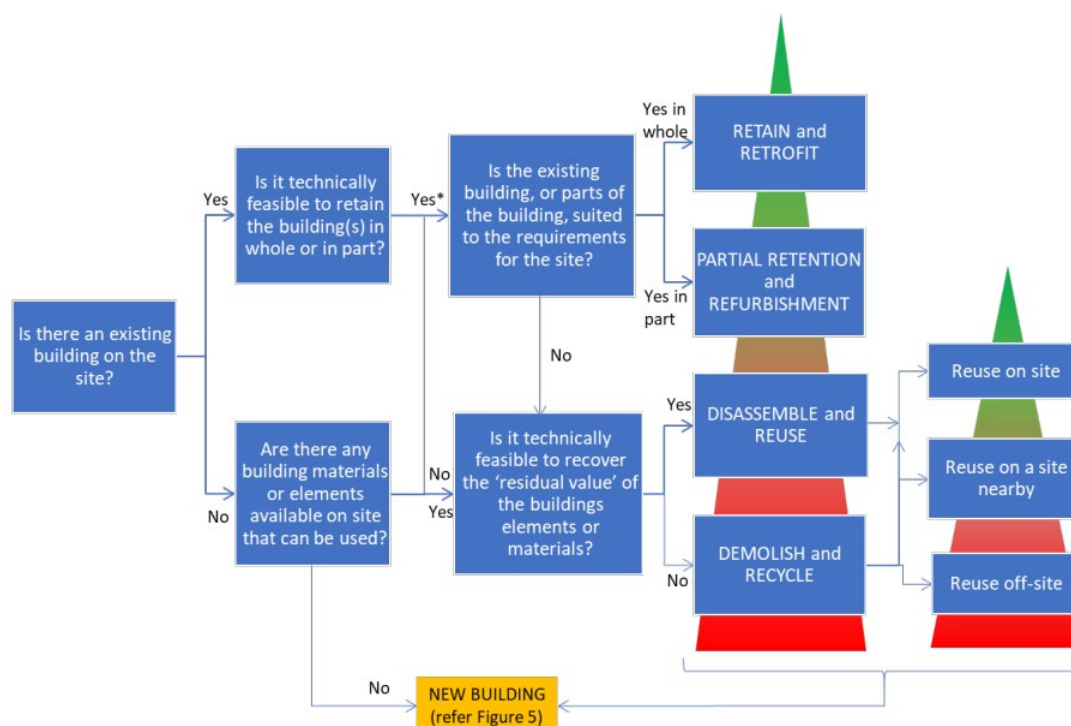


Figure 2 - Decision Tree for design approaches for existing structures/buildings (GLA, March 2022)¹

It has been confirmed that no existing structures exist on-site. Hence, no demolition will take place for this project.

In addition to this, the circularity of the new building must be evaluated, following the strategic approach methodology for the 'new buildings, infrastructure and layers over the lifetime of development' Decision Tree (Figure 3). This approach encourages the consideration of opportunities to add value over the lifetime of the Proposed Development. It has been concluded by the Client and Design Team that the whole building is not designed to have a short building life, nor is it foreseeable that the building will need to change its function within its design life. Despite this, for all layers of the building, circularity must be considered. The opportunities for circularity are summarised within the 6 Circular Economy Principles, outlined in Figure 3 below. For the new construction at Stoney Wood, design for disassembly, adaptability, replaceability, longevity and flexibility have all been considered, as well as opportunities to maximise material reuse on/off site and the diversion of construction and municipal waste associated with the redevelopment from landfill either through reducing the quantity of waste produced, reusing waste materials, or sending said waste to recycling (reduce, reuse, recycle).

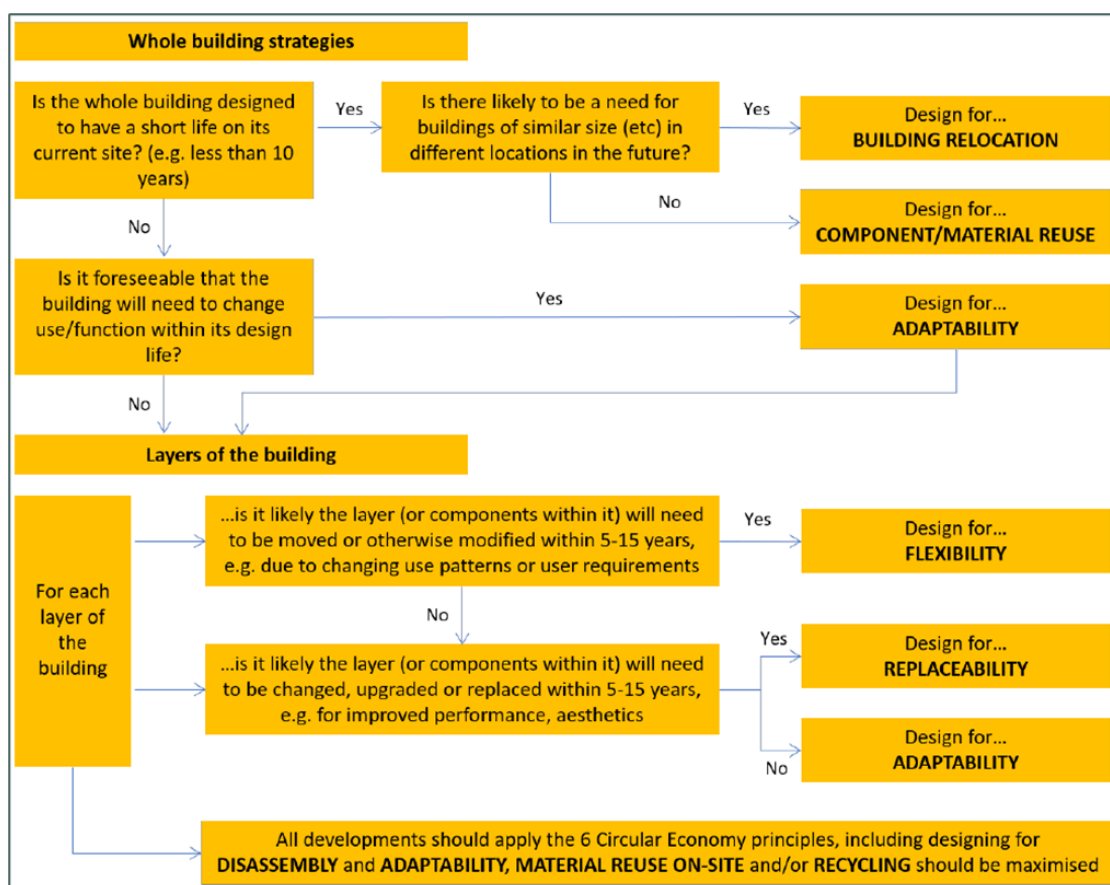


Figure 3 - Decision tree for design approaches for new buildings, infrastructure and layers over the lifetime of development (GLA, March 2022)¹

In conclusion, the design approaches for the new construction, infrastructure and layers over the lifetime of development, have been considered and embedded in design considerations. Further details of this can be found throughout the report.

1.2 Project CE Key Aims

As aforementioned, the Proposed Development includes a new construction upon the site at Stoney Wood Quarter, the Fairway, London, NW7.

Through the Design Team Meetings and ongoing dialogue with both the Client and wider Design Team throughout the early design stage process, the following points have been established as key aims of the site redevelopment:

- Provide good quality residential units.
- Utilise off-site recycled crushed material (Type 1) for hardstanding and piling mat.
- Provide a robust building design which is constructed with longevity and adaptability in mind and an ease of disassembly and flexibility.
- Reduce environmental impacts through consideration of the construction type and process, in addition to the materials used. Environmental impact will balance material sourcing with the lifespan of the materials chosen.

The background of the slide is a light beige or cream-colored paper with a marbled texture. The marbling consists of irregular, swirling patterns of slightly darker beige and light brown tones, giving it a classic, aged appearance.

Strategic Policy & Objectives

2.0 Strategic Policy and Objectives

The Proposed Development is required to meet the relevant planning requirements with regard to Waste and Circular Economy. These are summarised in Table 2.

Planning Policy	Requirement
The London Plan 2021	<u>Policy SI 7 Reducing waste and supporting the circular economy</u> Policy SI 7 states that referable applications should promote circular economy outcomes and aim to be net-zero waste. A Circular Economy Statement that meets the requirements set out in Policy SI 7 should be submitted, to demonstrate: 1. How all materials arising from demolition and remediation works will be re-used and/or recycled. 2. 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. 3. Opportunities for managing as much waste as possible on site. 4. Adequate and easily accessible storage space and collection systems to support recycling and re-use. 5. How much waste the proposal is expected to generate, and how and where the waste will be managed in accordance with the waste hierarchy. 6. How performance will be monitored and reported. Development Plans that apply circular economy principles and set lower local thresholds for the application of Circular Economy Statements for development proposals are supported. In line with Policy SI 7, this is to be done with the aim of: 1. Promoting a more circular economy that improves resource efficiency and innovation to keep products and materials at their highest use for as long as possible. 2. Encouraging waste minimisation and waste prevention through the reuse of materials and using fewer resources in the production and distribution of products. 3. Ensuring that there is zero biodegradable or recyclable waste to landfill by 2026. 4. Meeting or exceeding the municipal waste recycling target of 65 per cent by 2030. 5. Meeting or exceeding the targets for each of the following waste and material streams: a. construction and demolition – 95 per cent reuse/recycling/recovery. b. excavation – 95 per cent beneficial use. 6. Designing developments with adequate, flexible, and easily accessible storage space and collection systems that support, as a minimum, the separate collection of dry recyclables (at least card, paper, mixed plastics, metals, glass) and food. Circular Economy Statements will be required for all referable applications which set out how the Proposed Development promotes circular economy outcomes and the aim for net zero waste. Developers will be expected to reuse, recycle, or recover 95% of construction and demolition waste and find beneficial uses for 95% of excavation waste.
	<u>GG5 Growing a good economy</u> In line with GG5, those involved in planning and development will: a. Promote the strength and potential of the wider city region.

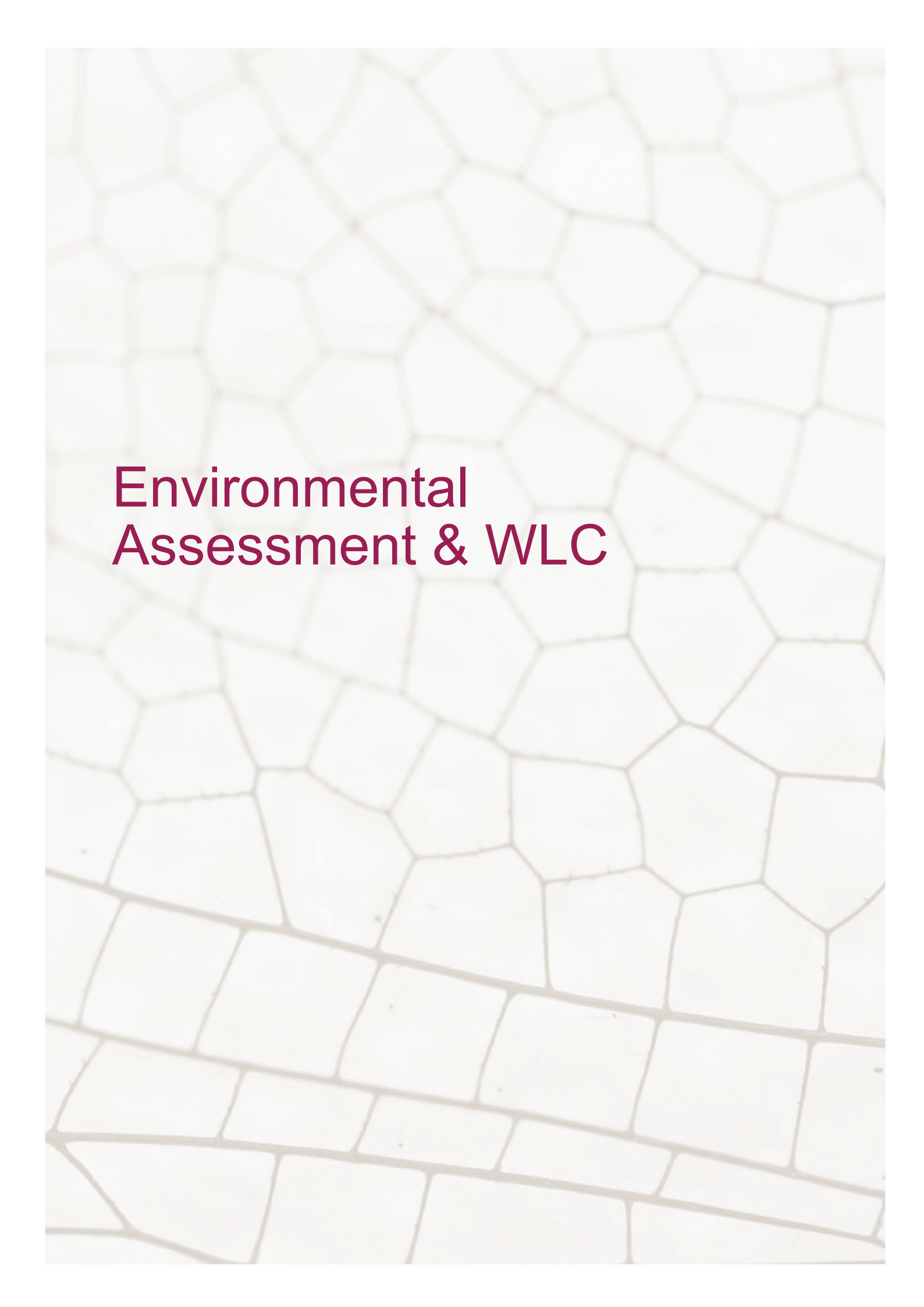
Planning Policy	Requirement
	b. Seek to ensure that London's economy diversifies and that the benefits of economic success are shared more equitably across London. c. Plan for sufficient employment and industrial space in the right locations to support economic development and regeneration. d. Ensure that sufficient high-quality and affordable housing, as well as physical and social infrastructure is provided to support London's growth. e. Ensure that London continues to provide leadership in innovation, research, policy and ideas, supporting its role as an international incubator and centre for learning. f. Promote and support London's rich heritage and cultural assets, and its role as a 24-hour city. g. Make the fullest use of London's existing and future public transport, walking and cycling network, as well as its network of town centres, to support agglomeration and economic activity. h. Recognise and promote the benefits of a transition to a low carbon circular economy to strengthen London's economic success. This will be done with the aim to conserve and enhance London's global economic competitiveness and ensure that economic success is shared amongst all Londoners.
Barnet Local Plan (2021–2036)	The Council is on a credible path to achieving net zero emissions and helping make London a zero-carbon city by 2050. The Council will abide to the Mayors work around designing for a Circular Economy and use the Mayor's energy hierarchy to help reduce carbon emissions from construction and operation and encourage retention and adaptation of existing buildings wherever practicable as well as encourage opportunities for on-site electricity and heat production, the use of innovative building materials and smart technologies. <u>Policy ECC03 – Dealing with Waste</u> The Council will encourage sustainable waste management by: a. promoting a circular economy through waste prevention, re-use, recycling, composting and resource efficiency over disposal. b. requiring developers to submit a Circular Economy Statement in accordance with London Plan Policy SI 7 and the North London Waste Plan. c. ensuring development is designed to provide appropriate space for storage and collection of waste and recycling facilities which fit current and future collection practices and targets. d. designating sites through the North London Waste Plan (NLWP) to meet an aggregated apportionment target across the seven North London Boroughs. These sites will be the principle locations considered suitable for waste facilities. e. safeguarding all existing waste facilities in Barnet, as set out in the NLWP. For any waste site subject to redevelopment for non-waste uses the developer must clearly demonstrate to the satisfaction of the Council that compensatory capacity will be delivered in line with the NLWP spatial framework principles on a suitable replacement site that must at least meet, and, if possible, exceed, the maximum achievable throughput of the site proposed to be lost. f. seeking to utilise additional waste capacity at Scratchwood Quarry as set out in the Schedule of Proposals

Planning Policy	Requirement
Global Sustainability Strategy	The World Commission on Environment and Development (WCED) report: Our Common Future², describes Sustainable Development as development that: <i>‘Meets the needs of the present without compromising the ability of future generations to meet their own needs’.</i> This principle has guided national policy since the WCED report and continues to be the foundation to which ‘sustainability’ is embedded within processes of all industries, including construction and development. Over the years, the policy requirements have become more prescriptive in nature, with targets on CO₂ emissions and resource use being tightened through Policy and Regulation changes as the UK moves towards zero carbon by 2050. Changes to regulations gradually aim to allow industry to adapt to new methods, whilst challenging industry leaders to provide innovative services, technologies and other solutions to meet the ever-stricter demands. Whilst sustainable principles are key to ensuring the reduction of pollution and CO₂ emissions (the main cause of anthropogenic Climate Change) their primary aim is to ensure that future generations have the same, if not better ability to meet their needs than the current generation. As such, wider aspects must be considered when looking at sustainability ‘in the round’. In line with the London Plan Circular Economy Guidance (March 2022)³, the Proposed Development will aim to be net zero-waste during its life cycle.

Table 2 - Summary of Planning Policy requirements

² [The World Commission on Environment and Development \(WCED\): Our Common Future. Available at: https://tinyurl.com/5755abum](https://tinyurl.com/5755abum)

³ [Mayor of London – London Plan Guidance – Circular Economy Statements. Available at: https://tinyurl.com/yckx9akr](https://tinyurl.com/yckx9akr)

The background of the slide is a microscopic image of plant tissue, showing a network of polygonal cells with thick, brownish cell walls. The cells are light beige in color and vary in size and shape, creating a honeycomb-like pattern.

Environmental Assessment & WLC

3.0 Environmental Assessment & Whole Life Carbon

A Whole Life Carbon Assessment (WLCA) has been undertaken in accordance with the 'RICS Whole Life Carbon Assessment for the Built Environment' to establish the Whole Life impact of the proposals in relation to embodied, operational and end of life CO₂ emissions. The assessment outlines the process of WLCA, and what is / what is not included. The aim of the RICS document is to provide clarity on the British Standard EN 15978: 2011 Sustainability of Construction Works, for the sustainability assessment of buildings, and the approach required within this methodology.

The aim of this assessment has been to model the whole life carbon impact of the proposed design, with the results used to inform the Circular Economy criteria of the London Borough of Barnet and the GLA planning policy guidance.

Overall, the Proposed Development has shown considerable effort in reducing the embodied and operational CO₂ emissions associated with its construction, with initial calculations showing an embodied and operational carbon as follows:

Module	WLC benchmark (kg CO ₂ e/ m ² GIA)	Aspirational WLC benchmark (kg CO ₂ e/ m ² GIA)	Result for this development
A1-A5 (excluding sequestration/ biogenic carbon)	<850	<500	472
B1-B5, C1-C4 (excluding B6 & B7)	<350	<300	555
A-C (excluding B6 & B7, including sequestration)	<1200	<800	838

Table 3 - Comparison of results with the GLA WLCA benchmarks

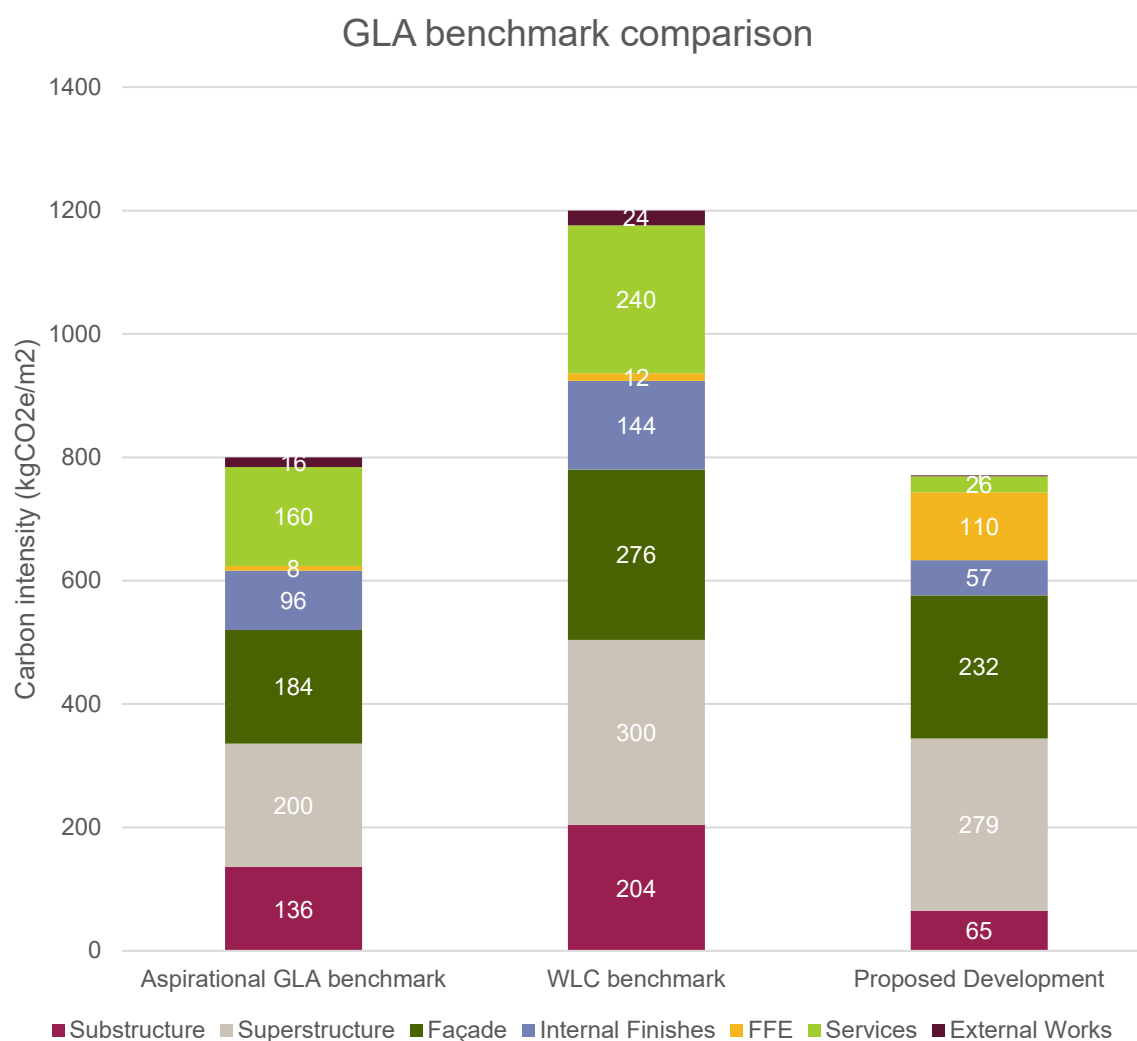


Figure 4 - Comparison of the Proposed Development's Carbon Emissions against GLA Residential Benchmarks

Lifecycle Embodied Carbon emissions

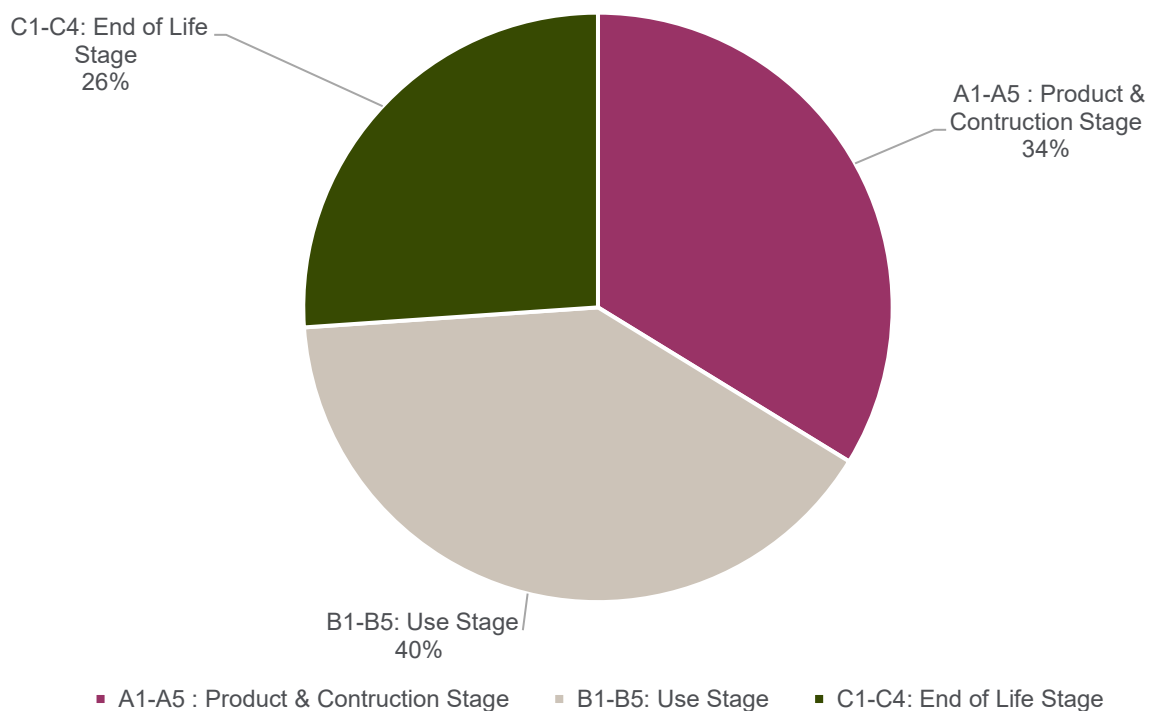
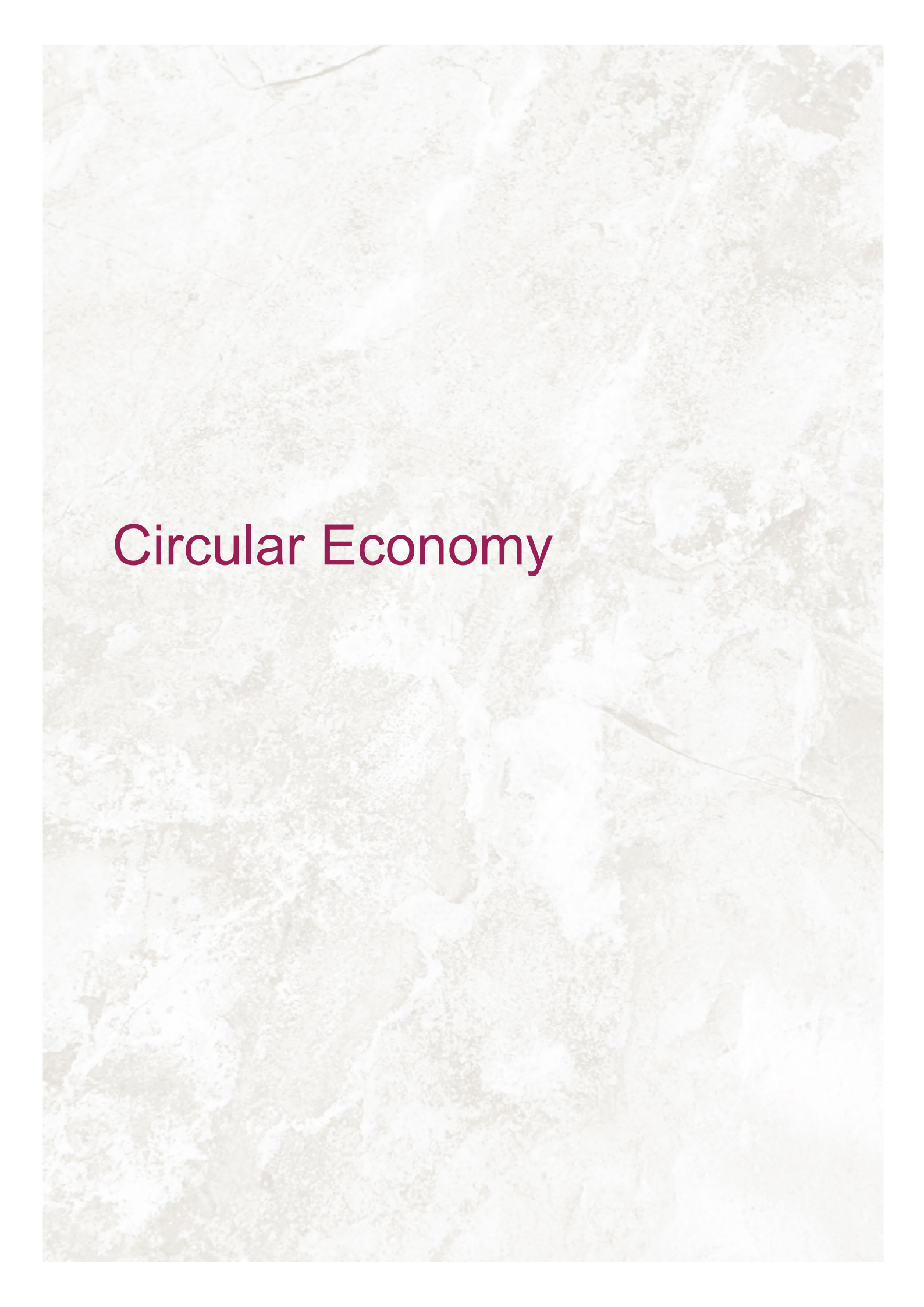


Figure 5 - Embodied Carbon emissions over lifecycle stages

Please see the supporting WLCA report for full details.

The background of the slide is a full-page image of marbled paper. It features a complex, organic pattern of swirling, mottled colors in shades of cream, light beige, and pale yellow, with some darker, brownish-green veins and spots. The texture appears aged and slightly grainy, typical of traditional marbled paper used in bookbinding or stationery.

Circular Economy

4.0 Circular Economy

The circular economy ethos is driving the move away from a 'Take – Make – Use – Discard' economy to a 'Re-make and Use Again' economy.

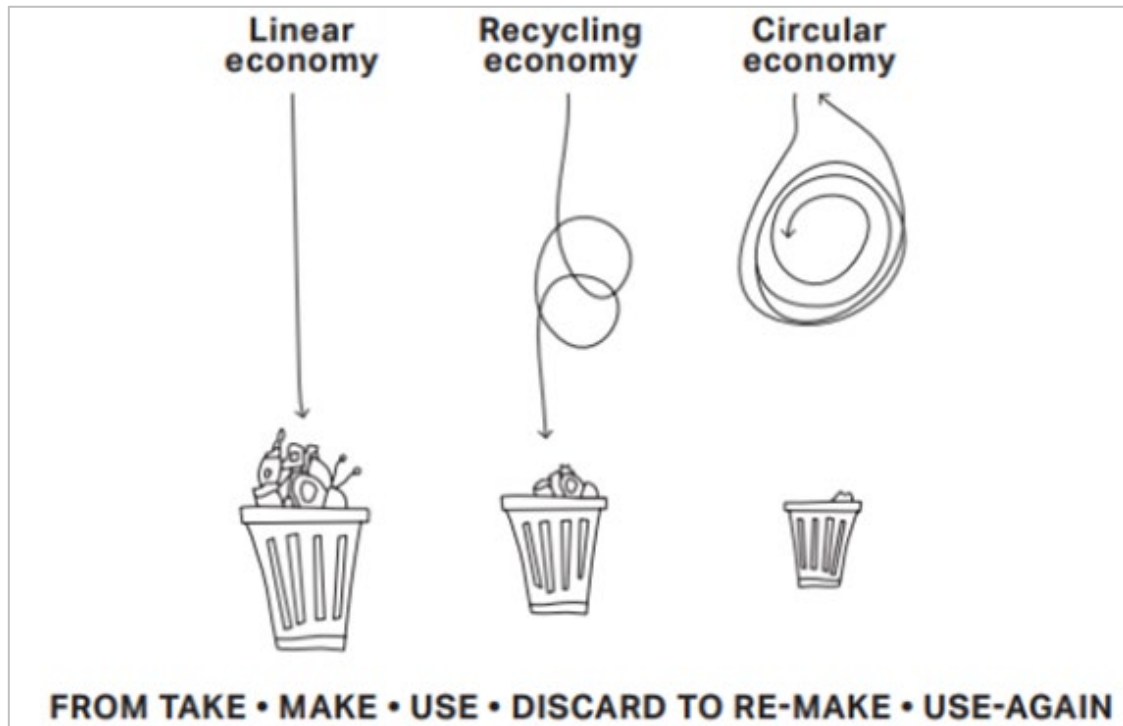


Figure 6 - Linear, Recycling and Circular Economies Diagram (GLA, March 2022)

As part of circular economy considerations, developments should aim to:

- Design out waste – consider impacts of waste from both construction, operation and end of life.
- Design for longevity – appropriate material specification for intended use.
- Design for adaptability and flexibility – meeting present and future needs within the building form and providing potential for the building form to be repurposed at a later stage.
- Design in layers – applying appropriate materials within the building layers which will allow them to be easily replaced when required, dependent on lifespan.
- Design for the future – individual products and services to be 'loose fit' to allow easy upgrade and replacement.
- Select appropriate materials – specifying low impact, recyclable and where possible, reused materials which have minimal impact on the environment and health & wellbeing.

For the construction industry, the impacts to the circular economy can be categorised into the following sections:

- Demolition and reclamation
- Design and construction impacts
- Site waste and its management
- Operational waste storage
- End of life disassembly and re-use

Impacts such as anticipated waste arisings at each of these stages are required to be considered and mitigated as much as possible to ensure that the impact is minimised, and materials are fed back into the supply chain to be re-used.

4.1 Design and Construction Impacts Assessments

The design of the Proposed Development prior to the specification of sustainable materials and construction methods has adopted an ethos of a 'circular' design which embraces the key sustainability concepts of longevity, adaptability and flexibility.

4.1.1 Longevity

A key element of circular economy is enhancing and extending the lifespan of a building - ensuring the durability of all materials will reduce the need for replacements and repairs and enhance the sustainability of the scheme as a whole through the promotion of resource efficiency. This is achieved through the appropriate specification of materials to secure a durable finish appropriate for its intended use. Materials which are not fit for purpose, or with inherent redundancy counter this approach and have been avoided within the design of the Proposed Development.

Material finishes both internally and externally have been chosen and evaluated to ensure a durability of finish appropriate for their intended use. Areas of high wear will be investigated further at the detailed design to ensure that, where needed, adequate protection is factored into the construction – i.e., materials are within an area sufficiently robust for the area's use.

Communal entrances, bin stores, core areas, corridors and communal spaces are all areas of high wear that will need a finishing strategy beyond that of exposed finishes. Therefore, a materials analysis will be undertaken to ensure materials are correctly specified based on the type of use expected and the damage to the material surfaces that may take place.

A durability strategy has been discussed, and a schedule of materials choices will be developed where fit-out is to be undertaken as part of the overall site development.

Ensuring the durability of all materials will reduce the need for replacements and repairs and enhance the sustainability of the scheme as a whole through the promotion of resource efficiency.

Besides human factors, external materials will also suffer from environmental degradation. Material finishes on the external elevations have been chosen for their hardness in addition to their architectural and construction qualities.

Façade options have been explored, and current design is a double skin wall from brick, with glazing that will introduce sufficient natural light to the residential units. These materials have been chosen for their hardness and longevity, in addition to their architectural and aesthetic properties.

Concrete has been proposed as it's a long-lasting material and is easily procurable. All concrete specified in the construction is proposed to be procured as locally as possible, with at least a 20% recycled/secondary aggregate content. The reinforced steel bars (re-bar) are produced from high % (>97%) recycled content and offer ease of re-use and recycling at End of Life (EoL) stage.

The client does not anticipate that the building will require re-purposing or requiring a change of use throughout its lifetime. However, concrete offers a great potential for crushing and re-use at the EoL stage.

4.1.2 Adaptability

The ability of spaces to adapt to present and future needs is key to securing long-term tenure within a property, creating established communities in addition to preventing the need for people to move house when circumstances change – putting pressure on housing stocks, care systems and potentially in turn promoting further development which could be unsustainable in the area.

The client does not anticipate that the building will require re-purposing or requiring a change of use throughout its lifetime.

The use of a reinforced concrete framed construction is a key factor on ensuring that the internal space remains as flexible as possible in the future, allowing the internal layout to be repurposed in the future to meet changing local needs.

The infill structure of the development will be made up of insulated dry-lining partitioning walls within and between adjacent flats and communal spaces, reinforced with metal studwork. These flexible structures can be easily disassembled and adapted throughout the lifetime of the Proposed Development, enabling the accommodation of any alterations to the purpose of spaces available within the building. Furthermore, at the end of the building life, a metal framed drywall partition will be more easily demountable and recyclable/re-usable allowing the differing elements to be separated (steel, plasterboard and, insulation) and disposed of appropriately.

4.1.3 Flexibility

The flexibility of a space allows differing applications to potentially use the current structure in the future.

Given the piled reinforced concrete foundations and substructure, there is limited flexibility within this dimension of the build. As such, these elements are likely to remain in future builds. However, there is flexibility within each block to allow it to fit the needs of the occupiers.

Moreover, the need for this has been largely designed out with flexibility built into the design, as each block has adequate space for minor alterations to allow the space to fit the needs of the users – each residential-like unit is designed to be open-plan other than the installation of the bathroom stud walls. This provides flexibility of choice without additional major demolition or construction works for the occupier.

4.2 Sustainable Procurement

As part of the procurement process, the use of materials with a high recycled content and/or locally produced will be investigated. In addition, the use of the suppliers and manufacturers with a certified Environmental Management System will also form a key part of the procurement strategy. These commitments to be upheld on site by the Principal Contractor once appointed (see tender commitment letter in Appendix A).

The design specification and procurement of lower impact construction products will be enhanced through the use of Environmental Product Declarations (EPDs) on all key materials

designed and procured as part of the Proposed Development. As an EPD is an independently verified environmental label in accordance with the requirements of ISO 14025, the reduced risk and environmental impact from poor supplier information will be avoided within the design and construction stages.

High recycled content is likely to be used for non-structural elements where the material content is less critical to the structural integrity of the project as a whole.

Internal finishing elements – where structural considerations are not applicable – will be sustainably sourced where this is not detrimental to the overall finish and quality of the products used.

Furthermore, as outlined above, >95% of all materials will be sourced from responsible suppliers, with >95% materials used also being non-toxic to avoid localised pollution.

Materials with a high content of recycled material will be prioritised within the procurement process to secure ongoing carbon savings and strive towards the GLA target of the specification of building materials made up of 20% recycled content. These materials have been specified in support of the reduction of embodied CO₂ emissions, with the materials specified outlined within the Whole Life Carbon Assessment.

A microscopic image of plant tissue, likely an onion skin, showing a clear arrangement of cells in layers. The cells are roughly rectangular and arranged in a brick-like pattern, with distinct cell walls. The text "Building In Layers" is overlaid on the image.

Building In Layers

5.0 Building in Layers

The Proposed Development has been designed to be robust in its construction type to prolong building longevity, whilst being sensitive to the overall aims of reducing on-site embodied carbon emissions in line with national and regional policy.

Additionally, in line with the GLA March 2022 Circular Economy guidance, the proposed design has adopted a 'Building in Layers' approach, maximising the durability of the Proposed Development whilst considering the whole life carbon impact of materials and processes.

To this end, it is anticipated that a minimum of 31% of the materials utilised within the Proposed Development will be 'Circular by Design', allowing elements to be removed and reused elsewhere when needed. The One Click 'Building Circularity' analysis from the WLC Assessment has indicated a circularity of the Proposed Development materials to be 31%. The materials hopefully re-used on site from the demolition will increase the circularity of the Proposed Development.

Building in Layers is a common method of assessing the validity of certain material types and proposed lifespan of these materials. Assessments can then be made as to the appropriateness of the materials and finishes adopted, and any potential reclamation that may be possible at end of life.

Building in Layers puts all elements of a building into a timeline with various life expectancies, and therefore the likelihood of renewal or replacement can be gauged, and an appropriate strategy used to mitigate any potential predicted issues in relation to the products, materials and finishes used.

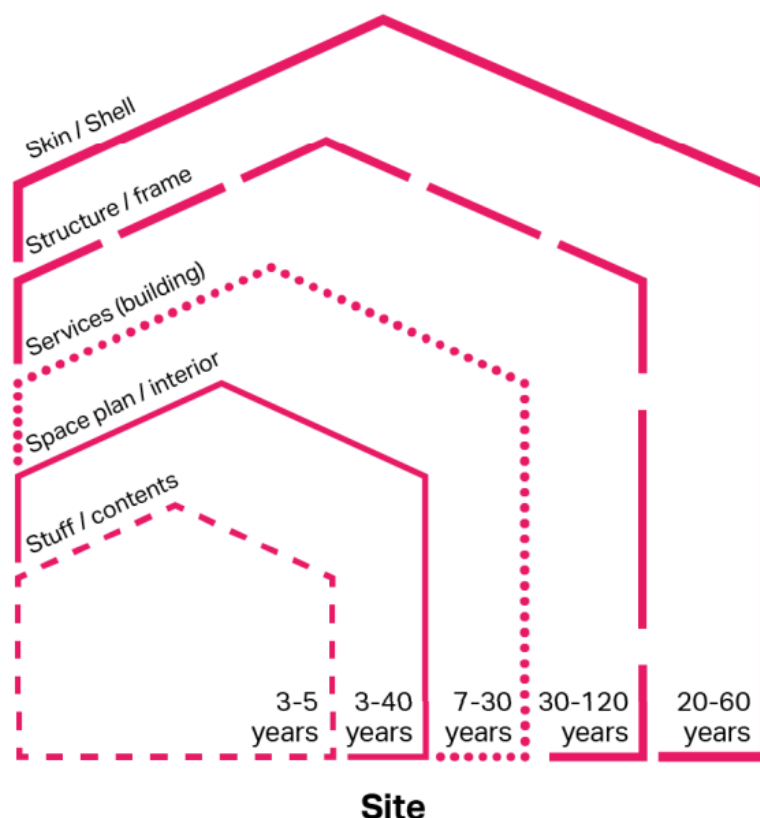


Figure 7 - 'Building in Layers' diagram and their indicative lifespans (GLA, March 20223)

STUFF: Including all furniture, desks, pictures, appliances, lamps, etc., which are typically supplied by the building user. Typical Lifespan: months/few years

Any appliances to be installed as part of the minor reception fit-out will be chosen with reliability, energy use, and environmental impact in mind. All appliances will be highly rated for energy efficiency and water use to ensure ongoing running costs are kept to a minimum. Based on the new Energy Efficiency Labelling scheme introduced from March 2021, a good performing appliance will meet the following ratings:

- Fridges/Freezers: E
- Washing Machines: B
- Dishwashers: D
- Washer-Dryers: D

The Project Team has confirmed that the above standards are achievable for the development and appliances will be carefully researched before specification. When purchasing appliances, resources and reviews in relation to usability, reliability, and cost of running will be consolidated and discussed within the Project Team to ensure that environmental impacts of proposed white goods are continually considered.

SPACE: The internal layout of the site is to be considered to provide durable and long-term space, with the potential for adaptability as use circumstances change. Typical Lifespan: 3-30 years

It is not proposed that the residential units will require a change of use or design throughout the building's lifetime, therefore a concrete frame for longevity was proposed.

Being a framed construction, internal spaces are easily adaptable where needed in the future to accommodate changes in lifestyle, well-being, or occupant density.

Framed internal partitions also allow each individual element to be removed as a whole (steel studwork, plasterboard, insulation etc) rather than the cutting, bashing and grinding associated with the fabric removal in more traditionally constructed co-living units.

Internal floors and walls in core areas shall be durable and designed to minimise risk of damage, for example through hard wearing floor finishes and kick plates to doors.

SERVICES: Heating, Ventilation and Electrical installations. Typical Lifespan: 7-15 Years

The Project Team confirmed during the Circular Economy Workshop that an MEP contractor has not yet been appointed, but that some pre-emptive assumptions have been made relating to the MEP strategy for the Proposed Development. Below is a summary of the currently assumed ventilation, heating, and cooling measures to be installed. This list may undergo alterations in future when the MEP contractor is confirmed and as a result of the recommendations detailed in the Energy Statement to be produced for the Proposed Development.

- Mechanical Ventilation and Heat Recovery (MVHR) is to be installed within the residential units.
- Comfort cooling (Natural ventilation) is to be used throughout the development.
- Mechanical cooling using hybrid MVHR add-on units is proposed.
- Anticipated that the plant room is to be located on the ground floor.

- Installation of an Air Source Heat Pump has been considered for heating of the development (cooling of up to 10 degrees).
- A Solar PV panels system will be installed.

The use of Mechanical Ventilation with Heat Recovery (MVHR) will provide air changes whilst maintaining internal temperatures and reducing heat losses.

All plants installed will be designed to be removed in its entirety, without the need to dismantle prior to removal, allowing this to be removed and replaced easily in a modular manner. Access to these plant spaces will be appropriately sized to allow equipment to be removed and replaced, with the size of door openings and corner access for these items also properly considered at Detailed Design Stage.

STRUCTURE: Structural Elements. Typical Lifespan: 30-300 years

Ready-mix concrete piling, caps and ground floor with steel re-bar have been specified. A reinforced concrete framed structure has been chosen for both the ease of construction, ability to use recycled content and for longevity of the Proposed Development. A perk to using concrete for structural elements, is the ability for it to be crushed and reused as secondary aggregate as part of a new development or recycled/reused off-site. Additionally, the steel re-bar and framework can be removed and recovered due to steel being a widely recyclable material during the EoL process.

This construction will provide a durable and long-lasting building structure which will last beyond its anticipated 60-year lifespan and will have the potential to support a multitude of future uses if/when the need arises. Whilst there is no Heat Network currently available, a space has been provided for future connection if one becomes available.

SKIN: Cladding, Renders, and Brickwork. Typical Lifespan: 30-300 years

External finishes often have the biggest impact on the overall durability of a development. They are exposed to the weather, are subjected to less routine maintenance and activities surrounding these elements and are generally less managed when compared to internal surfaces. The wrong specification of materials can result in reduced lifespan, increased maintenance, and a poor appearance to the exterior of the building, resulting in lower asset prices and less desirable properties.

The red brickwork facade has been chosen for longevity purposes, albeit it is recognised that the recovery of this element can be troublesome due to the separation of the mortar from the brickwork at end-of-life stage. However, due to the nature of the material, it is anticipated that this will not be required until the building reaches its end of life. Mineral wool insulation and plasterboard provide an efficient insulation system. This build up withstands minimal degradation over time.

Moreover, natural insulations (i.e. Rock/mineral wool) and gypsum plasterboard provide an efficient insulation system and are both widely re-usable and recyclable at EoL.

SITE: Location, boundaries, surrounding context, Typical Lifespan: Infinite

The site location is the one element of the Proposed Development that will last forever. Long after the current buildings have been decommissioned and replaced, the site will remain only to be redeveloped again to form something which will meet future generation's needs.

The site location has been deemed appropriate for the intended uses as this is in keeping with the surrounding context of existing recent development in the area.

Being located within the London Borough of Barnet, which is a heavily developed area, the proposals fit the aesthetic and current use classes of the surrounding area, and as such will 'blend' with other recent developments.

Materials on the site will be non-toxic, and no material used on the site will prevent the site's future use or redevelopment.

5.1 Site Waste Management

Site waste will be managed on site through a Site Waste Management Plan (SWMP). The SWMP emphasises the need to minimise waste leaving site and the reuse of materials on the site in line with the waste hierarchy, depicted in Figure 8 below. Waste from the site will be managed via a certified waste contractor and will be monitored through best practice site management procedures.

To comply with the GLA guidance on Circular Economy, the Recycling and Waste reporting table (0) will be completed and is referenced within the Site Waste Management Plan for module stages A to C (the product sourcing, use and end of life stages). This will cover:

- The total amount of non-hazardous/contaminated waste material arising (tonnes) for excavation, demolition and construction
- The percentage of non-contaminated material reused on-site, recycled on-site, reused off site and recycled off-site
- The percentage of waste sent to landfill amount
- The percentage of waste recovered
- Clearly defined targets that meet the London Plan and Barnet Council policy targets:
 - >95% reuse/recycling/recovery of construction waste
 - 95% beneficial use of excavation waste
 - 65% recycling of municipal waste by 2030
 - Apply a commitment to the London Environment Strategy business waste recycling target of >75% (by weight/tonnage) by 2030

Targets that go above those set by the London Plan policy SI 7(A) will also be sought where possible. The quantity of waste diverted from landfill will be in accordance with Appendix A (Circular Economy Commitments), as a minimum, with the overall aim that the development will be net zero waste, with all waste either being re-used on site or recycled via a licenced waste contractor. Regular reports (minimum monthly) will be provided by the waste contractor and stored as part of ongoing site monitoring and management. Where deviations from the zero-waste strategy become evident, actions will be organised to ensure that the zero-waste strategy is adhered to.

In accordance with the principles of the London Plan and Barnet Council, all waste on site will be managed in accordance with the waste hierarchy, with a target for 0% of biodegradable and/or recyclable material being sent to landfill.

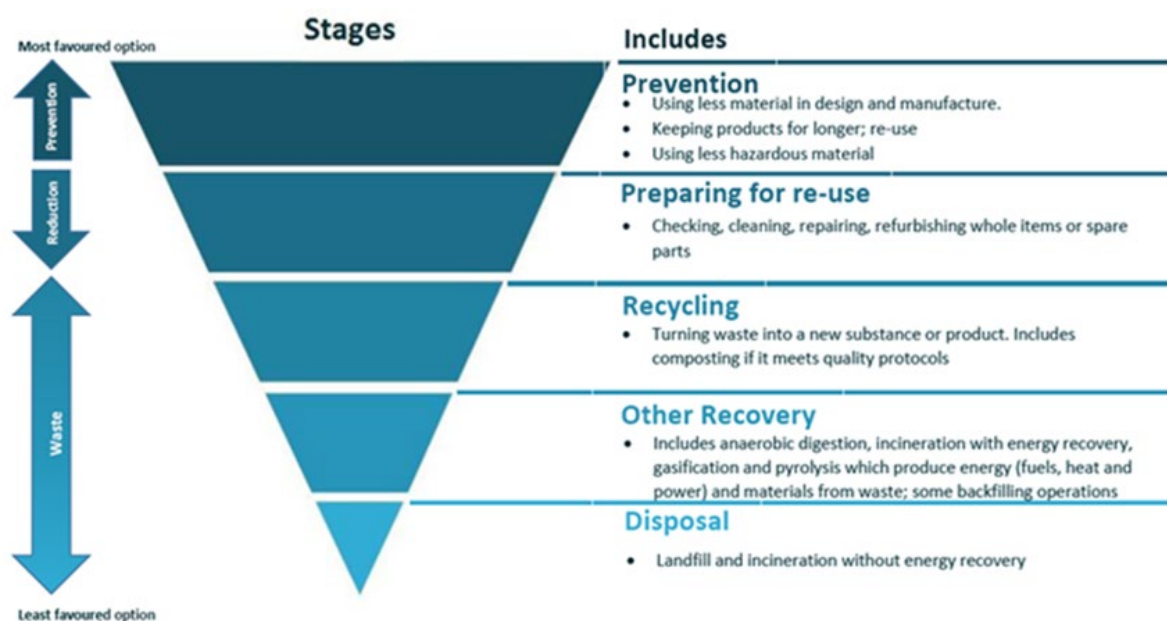


Figure 8 - The Waste Hierarchy

Where waste must be removed from site and is not re-usable, this will be managed through a licenced waste contractor in line with the benchmarks for diversion from landfill set out in the London Plan policy SI 7(A) as an absolute minimum.

To facilitate the re-use of materials on the site, appropriate areas will be allocated within the Construction Works Plan, and detailed in the associated method statement, for the storage of re-usable materials from the construction phases. The aim of this materials storage will be that this material can be used elsewhere on the site and reduce the waste removed from site.

Excavation is to be undertaken on the site during enabling works to install piled foundations suitable for the proposed construction. No demolition will occur on-site.

5.2 Site Resource Use

5.2.1 Energy Use from Site Activities

The Design Team has confirmed that an Energy Champion will be selected from the beginning of site works who will be responsible for the monitoring, cataloguing, and reviewing of site wide energy use. This is likely to be the Main Contractor, and they will be informed of this requirement pre-appointment, during the tender process. Appendix A contains a commitment letter from the Project Team, confirming that the Main Contractor will be informed of this responsibility.

Targets for energy use throughout the construction program will be set based on previous experience, with the actual usage tracked and reported twice weekly – Appendix B includes workshop meeting notes confirming the Project Team's commitment to monitoring energy, water and waste throughout the construction phase, operational monitoring, and a tender commitments letter from the Client confirming that a Resource Management Plan (containing targets for energy and water usage, waste production and the transport of materials and waste) will be produced for the development by the Principal Contractor. These records of

energy usage will then be fed back to the Site Manager who will work with the Energy Champion to reduce energy use to the lowest possible rate.

Energy Efficiency will be a significant part of the Site Induction Process with each member of the site team accountable for the enforcement of energy efficient measures, with a reporting structure in place for non-compliance.

Where possible, strategies and technology will be utilised throughout the site to reduce energy consumption such as:

- Enhanced building fabric in line with Building Regulations 2021 Part L
- High efficiency LED lighting with PIR automatic on-off controls and daylight sensors
- MVHR to provide ventilation
- High efficiency VRV system (air-to-air heat pumps) to provide heating and cooling to reception, apartments and kitchen, with cooling only in the server room
- Air Source Heat Pump for water heating

5.2.2 Water Use from Site Activities

As with energy use above, the Principal Contractor appointed will champion the water saving efforts on the site and record and monitor water use throughout the duration of the project.

Targets will be set for water use based on best practice and previous experience, with records kept at a minimum of weekly intervals to inform ongoing saving measures and for evidence of commitment to this goal). Key information on the saving of water resources will be provided as part of the induction to site for all operatives.

Reporting systems will be in place for the wasting of water, and each member of the site team made accountable for the enforcement of water efficiency measures.

Water use for welfare will be reduced through the use of no water, or low water use urinals, and low flow fittings where this is appropriate. PIR and solenoid valves will also be installed where this is considered to be appropriate and effective in reducing water consumption.

5.2.3 Waste from Site Operations

The use of single use plastics will be avoided through the provision of the following welfare facilities to encourage a more sustainable and low waste operations on site:

- Chilled, fresh water made available to all, with re-usable cups or bottles – to avoid the use of single use plastic bottles.
- Refrigeration – appropriate facilities available for the storage of food and other items which would otherwise be bought – reducing the associated packaging.
- Kettle & mugs to be provided to prepare tea and coffee – reducing the need for take-aways in disposable cups.
- Appropriate wash-up facilities to wash and re-use the mugs and cups provided.

The potential for the incorporation of the above will be dependent on the precise site welfare facilities available at each construction stage, but as much as practicable will be incorporated where possible.

The precise details of the facilities to be provided will be outlined in the Contractors Construction Works Plan.

5.3 Operational Waste

The ability of the occupier and/or building users to appropriately sort and store waste as part of the general operation of the self-storage facility is strongly influenced by the location and ease of access to the internal and external waste stores provided.

Therefore, the appropriate storage of refuse and recycling - both internal and external - will be incorporated into the overall design and layout of the scheme to facilitate a recycling rate of 65% or greater, in line with GLA requirements.

The developers are to ensure waste containers are utilised efficiently in order to reduce the number of collections and therefore collection vehicle traffic. To avoid obstruction to the local highways, a stopping space will be allocated to allow the collection vehicle to stop adjacent to the site. It will also be ensured that at no time bins will be left on the public highway.

5.3.1 Operational Waste Management Plan

The developer needs to recognise that waste will be generated by the site's future tenants and therefore will take measures to ensure that this takes place as responsibly as possible. The waste hierarchy will be promoted and explained to the client to ensure that waste generation is minimised. Once all avenues for prevention have been examined, opportunities to maximise for re-use, recycling and recovery will be targeted.

The provision of information on the ability of occupants to recycle items is shown to strongly increase recycling uptake. Therefore, information on the waste bins provided, what can be placed in each bin, where larger items can be taken and when, will be provided to building users to inform their waste decisions during the operational phase of the development. A Welcome Pack provided to all new residents will include clear and accessible guidance on the waste segregation system, bin locations, collection days, and what materials can be recycled. Illustrated signage will be affixed to each bin inlet point, indicating which materials should be deposited.

Figures of expected operational waste generation will be continually managed and reported to ensure that waste storage is of an adequate size to support the needs of the building occupants and maximise potential recycling levels. Sensors are equipped to the iceberg bin system to see waste levels within each of the bins and consider where additional provisions are required.

While operational waste generation is dependent on tenants, the approach taken by the developer will maximise the opportunities for tenants to make suitable and responsible choices in order to lower their waste generation while maximising the percentage of waste which is recycled. Detailed Operational Waste Management Plan is included under Appendix G.

5.3.2 Operational Waste Storage

To ensure this is possible, the site will provide adequate, flexible, and easily accessible space for segregating and storing waste for collection, recycling, and reuse in line with the London Plan. This will ensure that waste can be sorted and stored suitably between collections and will be explained to the future tenants. In addition to this storage, there will be a dedicated area for food waste with bins provided in tenanted areas and kitchens. The project will incorporate an iceberg bins system, 5,000 litres capacity for each bin, to allow for storage between collection times.

In addition, consumables within the buildings – furniture, decorations etc. – are not within the control of the contractor. These items, in accordance with the Building in Layers methodology,

have the shortest lifespan and have a significant impact on the quantity and type of waste generated by the Proposed Development during operation. Therefore, further information on the impact of waste disposal, with a focus on the use of natural, biodegradable products will be provided to building occupiers, in addition to information about reusing, repurposing, and upcycling to minimise the quantity of consumables being sent to landfill.

5.4 Maintenance Replacement and Repair

Throughout the lifespan of a development, elements of the build will need to be replaced and/or repaired as part of general maintenance as elements are damaged or reach the end of their natural lifespan.

In accordance with the Whole Life Carbon Assessment undertaken for the site, it is estimated that the maintenance repair and replacement of building elements (calculated under the B2, B3 and B4 RICS lifecycle stages) accounts for 15,395,021 kgCO₂e of the buildings predicted 60 year life span.

Carbon which is expended here results in savings from other areas and repair, replacement and maintenance allow the life of items to be extended. Maintenance is included as the other CO₂ emissions associated with such repair work, including products such as cleaning supplies, labour and travel emissions.

Estimated factors for Module B Construction Waste are driven by the expected lifespan of each material, as modelled in OneClick LCA. Table 4 shows detailed calculations for a sample of materials with different lifespans, to demonstrate the basis of Module B Construction Waste calculations.

Material	Lifespan	Number of Replacements	Construction Waste - Module A	Construction Waste - Module B*
Ready-mix concrete	60	0	5%	0%
Reinforcement steel (rebar)	60	0	5%	0%
Gypsum plasterboard	30	1	12.5%	12.5%
Aluminium framed curtain wall	35	1	0%	0%
Wooden interior doors	20	2	0%	0%
Suspended ceiling systems	25	2	7.5%	15%
Roofing clat tile	60	0	5%	0%
Synthetic carpet tiles	7	8	10%	80%
Electric vertical radiator	20	2	1%	2%

*number of replacements x Module A

Table 4 - Module B Construction Waste calculation sample

5.5 Material Recycled Content

Outlined below are the major, predominant building elements and materials included within the Proposed Development based on the currently assumed build outs for all elements, with predicted re-use and recycling values.

Element	Material	Predicted quantity (kg)	Gross intensity (kg/m ² GIA)	Recycled Content (% by value)
Substructure	Steel reinforcement	856,749	29	97%
Superstructure	Steel reinforcement	1,219,836	31	97%
	Ready-mix concrete, RC 40/50, 25% (GGBS)	11,446,631	291	2%
Upper Floors	Glass wool insulation	114,406	3	50%
	Steel reinforcement	603,014	15	97%
	Profiled & Galvanised steel decking	30,472	1	70%
	PVC floor covering	25,363	1	15%
Shell	Gypsum plasterboard	229,336	6	25%
	Aluminium façade cladding panel	64,832	2	70%
Space	Concrete masonry unit	2,916,005	74	22%
	Gypsum plaster board	866,340	22	50%
Furnishing	Several Wood Products	172,459	5	50%

Table 5 - Major construction materials and their recycled content

Recycled and reused content has been calculated in accordance with the methodology set out in Appendix 3 of the GLA Circular Economy Guidance. Material quantities have been extracted from the OneClick LCA whole life carbon model, which references a mix of Environmental Product Declarations (EPDs) and industry database defaults to determine the recycled content percentage for each material. Where EPD-specific data is available, this has been prioritised; where EPDs are not available, OneClick LCA database default values have been applied as a conservative estimate.

Recycled content by mass has been calculated by applying the recycled content percentage to the total material quantity for each element. Recycled content by value has been calculated as a cost-weighted proportion across all materials, using estimated unit costs aligned with current market rates, as per OneClick database. Where the cost per unit was not available in OneClick database, average market research was obtained. Appendix E presents the detailed supporting calculations for all materials with recycled content, which are included within the Bill of Materials.

5.6 End of Life Disassembly and Re-Use

The end-of-life opportunities for material recovery have been investigated as part of the design process with the requirement for disposal, recycling or repurposing considered as a key part of product and material selection.

The implementation of a materials inventory will be investigated by the Design Team to itemise all materials and/or products to be used, and the potential for these materials to be re-used, repurposed, recycled or otherwise disposed.

Internal fixtures, fittings and equipment are those with the shortest lifespan, and therefore the replacement of these should be considered as a high priority, and materials which are biodegradable or highly recyclable taking precedent over alternatives to minimise the impact of the more consumable items within the Proposed Development.

The consideration of the materials used on the site have been selected on multiple basis including the potential for re-use at the end of the building's useful life. Where sustainable options are not possible or available, high quality and durable materials are selected to ensure a long and maintenance free lifespan of the building, with appropriate elements being easily replaced or repaired where needed.

The end-of-life scenarios of key components and materials have been further considered, with the design seeking to maximise reuse and recycling wherever practicable. In particular, the proposals aim to support disassembly and material recovery through the use of standardised component sizes, mechanically fixed rather than permanently bonded connections, and a clear structural and façade grid that reduces the need for custom cutting and complex dismantling.

More specifically, the design can facilitate end-of-life outcomes through the following strategies:

- Bolted or screw-fixed connections to primary structure, façade elements enabling removal and reuse.
- Modular and standardised elements, such as repeating structural bays, prefabricated panels, and standardised finishing systems, to simplify replacement and recovery.
- Design for access, ensuring plant, risers, and MEP equipment are located and detailed so they can be safely removed, refurbished, or replaced.
- Avoidance of composite or heavily bonded assemblies where they would impede separation of materials.
- Material selection favouring widely recyclable products, such as steel, aluminium, glass, and timber, with recyclable insulation and finishes where feasible.
- Clear separation of material layers, so that structure, cladding, services, and internal fit-out can be dismantled independently.
- Provision of documentation such as a materials log or "resource passport" to identify components, fixings, and recovery routes at end of life.

The predominant construction materials on the site are concrete and brickwork – all of which are potentially re-usable when the building reaches the end of its life. At present, it is estimated that ~31% of the materials used on site will be reusable, but the primary focus has been on providing a robust, durable, and long-lasting building structure. Brickwork is to be unrendered, therefore minimising the effort required to clean up the product at end of life.

It is also anticipated that, in line with the March 2022 GLA benchmarks, the Proposed Development will meet the following targets for diversion from landfill: 95%

reuse/recycling/recovery of construction waste, 95% beneficial use of excavation waste, and 65% recycling of municipal waste, with all waste sorted into the key EU waste groups.

Concrete foundations are the least re-usable element of the scheme. Piled foundations can reach up to 20m into the ground and will not be easily extractable or recoverable. However, these could well form the foundation for any other structure on the site if there is desire for a refurbishment or other use at the end of the life of this building. Concrete is inert and non-toxic in nature, and therefore the presence of these in the ground causes little-to-no lasting impacts.

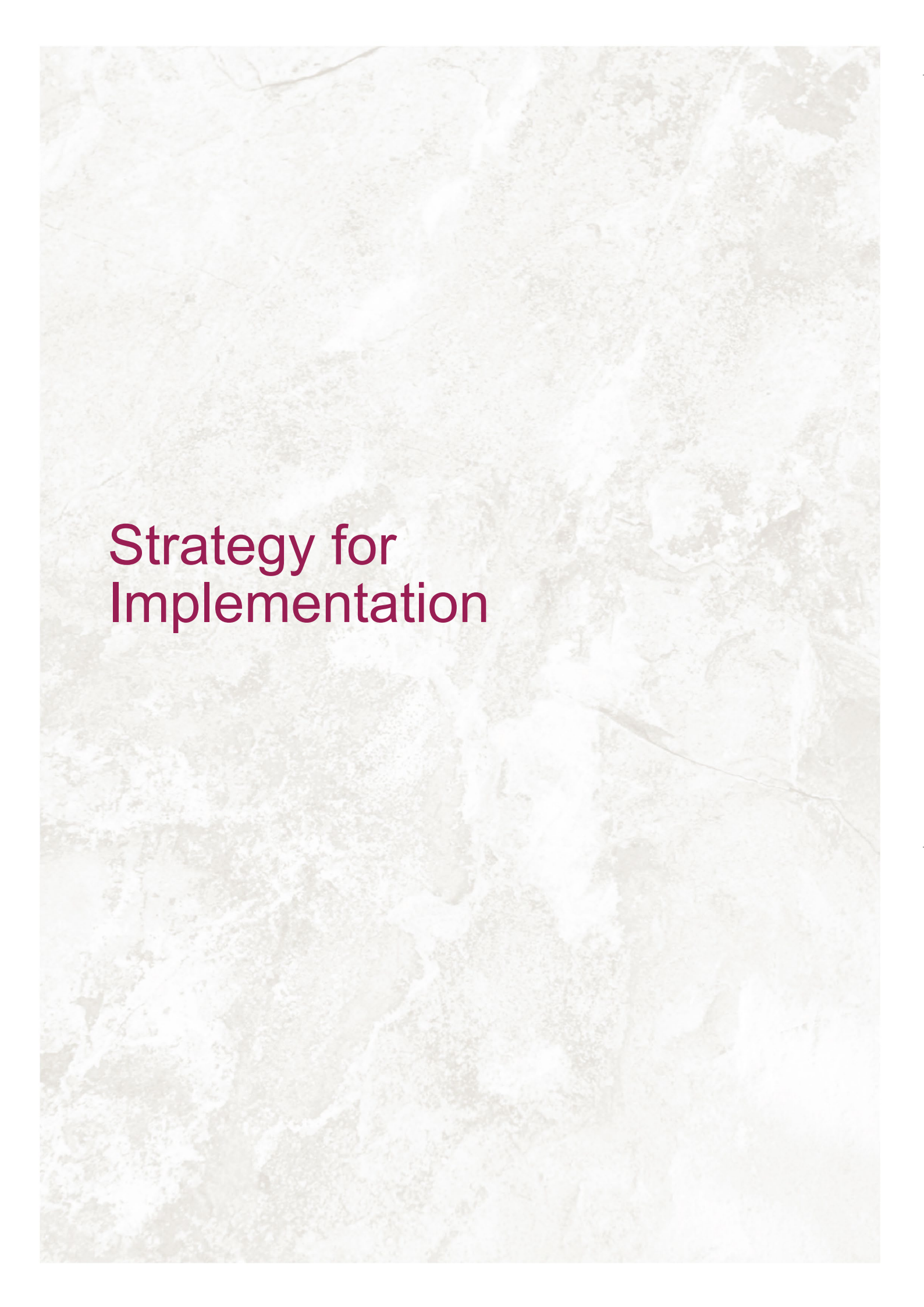
Outlined below are the major, predominant building elements and materials included within the Proposed Development based on the currently assumed build outs for all elements, with predicted end-of-life scenarios and circularity.

Category	Total kg	Virgin %	Materials Recovered %	Downcycling and use as energy %	Recycling and reuse as material %	Materials returned %	Circularity %
Concrete	51,375,276.63	98.06	1.94	100	-	50	25.97
Metal	2,727,024.02	5.48	94.52	-	100	100	97.26
Bricks and ceramics	729,082.1	100	0	100		50	25
Gypsum-based	3,004,246.98	84.8	15.2	60.53	39.46	69.73	42.46
Insulation	453,637.48	76.79	23.21	49.86		24.93	24.07
Glass	822,964.67	90.5	9.5		100	100	54.75
Wood and biogenic	1,124,547.7	3.15	96.85	100		50	73.42
Earth masses and asphalt	786,663.45	99.22	0.78	32.8	3.9	20.3	10.54
Other materials	846,059.19	67.28	32.72	57.11	40.06	68.61	50.67

Table 6 - Major construction materials and EoL (End of Life) strategy

The physical constraints of the site and the high density of the building (floor area to footprint ratio) mean that the volume of materials used within the Proposed Development will exceed the volume of materials that are able to be re-used on site. Therefore, the majority of materials will need to be recycled off site by a licenced contractor at the time of dismantling/demolition.

The concrete and asphalt materials are easily recyclable at EoL through crushing and use as recycled content and secondary aggregate for future building materials. The steel re-bar will have recycled quantities of >97% and has full EoL recyclability potential. Materials such as the gypsum plasterboard, will need to be recycled off site by a licenced contractor at the time of dismantling/demolition, for reuse. Insulations, from natural substances, will most likely be segregated and diverted from landfill through re-use elsewhere or through energy recovery. Brickwork could either be reused on other sites or crushed and used as recycled content.

The background of the slide is a light beige or cream-colored paper with a marbled texture. The marbling consists of irregular, swirling patterns of slightly darker beige and light tan, giving it a classic, aged appearance.

Strategy for Implementation

6.0 Strategy for Implementation

6.1 Existing Site

Following a Circular Economy workshop with the Design Team, it was confirmed that no demolition will occur on-site.

6.2 New Development

The Proposed Development of the site will follow best practice in terms of building design, construction methods and operational energy (and therefore CO₂ emissions) requirements. The proposed building design will be designed with the Building in Layers methodology in mind and refined throughout the building process to enhance its efficiency.

The application of the Building in Layers strategy and circular economy principles will continue to be embedded within the future design process and will assist in the refinement of the overall site design and its efficiency. The circular economy ambitions outlined within this statement will be embedded within the future brief for detailed design and construction.

The engagement of key stake holders will continue to be required throughout the design process, and the materials procurement, and waste management. Consultation and engagement with Circular Economy principles has been and will be sought from the following team members:

- Principal Contractor and supporting team (estimators etc)
- Architect
- Structural Engineer
- Waste Consultant
- M&E Consultant
- Client

Please note that the above list is non-exhaustive and input from other members of the team may be required at key times. As mentioned previously, a Circular Economy Workshop was held on 08.05.2025, with the aim of establishing goals regarding waste and principles of circularity within the new construction. Post-meeting notes can be found in Appendix B of this report.

6.3 Operational Waste

Operational waste storage for the Proposed Development has been based on the guidance provided by the Barnet Borough Council Local Plan and the London Plan (March 2022 Circular Economy Guidance). This guidance was seen as the most relevant advice for the site given the proposed use and occupancy.

As per the OWMP, provided under Appendix G, the following have been considered:

- Quantity of operational waste is expected to be 84,590 litres for general waste and 84,590 litres for recycling waste (OWMP Section 2.2). This amount is equivalent to 8,964 Kg per week in total.
- The recyclable waste streams to be collected are glass, cans, plastic, paper and cards (OWMP Section 2.1).

- The iceberg bin system will provide a separate containers for residual waste and dry mixed recyclables, while the food waste will be managed using the 7L food waste bins. There is a possibility that food waste may have a dedicated iceberg bin, or be collected by a designated food waste vehicle (OWMP Section 3.2, 4.2). Moreover, each residential unit will feature a minimum of three internal compartments: residual, dry mix recyclables and food/kitchen organic waste. (OWMP Section 4.1).
- The Sulo iceberg bins will be equipped with fill-level sensors that transmit real-time data to the on-site concierge. This enables proactive collection requests, collection scheduling, identifying patterns of high usage, and reporting to LBB on waste diversion rates and recycling performance (OWMP Section 5.4).
- The proposed waste storage system is based on underground 'iceberg' bins, emptied by a HIAB-type refuse lorry. The system proposed is manufactured by Sulo, a leading European waste management solutions provider. Pre-occupation liaison between the applicant, LBB Waste Management and FCC Waste will be undertaken to confirm operational procedures and service arrangements prior to first occupation (OWMP Section 3.1).
- The collection schedule is proposed based on a mix of regular schedule and on-demand collection, where the collection of recyclables, general and food waste will be weekly, while bulky, hazardous, electrical, clinical and commercial waste will be on-demand (OWMP Section 2.1).

6.4 Post Completion Report

In line with the requirements of the GLA, a post-completion report will be provided to show progress against all numerical targets outlined within this report with updated waste information and Bill of Quantities. This will be secured by planning conditions in stages as appropriate.

The background of the slide is a microscopic image of plant tissue, likely an endodermis. It shows a honeycomb-like pattern of cells. The cells in the upper portion are roughly hexagonal or pentagonal. The cells in the lower portion are more rectangular and arranged in a more regular, brick-like pattern. The cell walls are stained a light brown color, highlighting the thickened corners (cornuata cells) characteristic of endodermal tissue.

Conclusion

7.0 Conclusion

This Circular Economy Statement demonstrates the sustainability measures incorporated within the design of the Proposed Development at Stoney Wood, Barnet. It details the adoption of Circular Economy principles throughout the design, construction, and operation of the Proposed Development.

Through the incorporation of fundamental sustainability principles, the Proposed Development has:

- Demonstrated how materials have been selected on site based on longevity and/or environmental impact.
- Shown how waste generated from site will be targeted, reduced, and managed appropriately in line with the waste hierarchy.
- Adopted a flexible and adaptable design which will meet the needs of the present and future.
- Specified materials which are appropriate to their intended use and take account of durability and longevity.
- Used 'Building in Layers' principles to ensure that elements needing replacing within a shorter time period can do so easily.
- Considered operational waste generation and provided adequate internal and external storage, in addition to providing information to future occupants about the reduction of waste from consumable items and the impacts this has.
- Considered end of life impacts and the potential for material re-use following building disassembly.

Through a considered approach to fundamental sustainability principles and Circular Economy, the Proposed Development responds positively to the requirements and principles of this policy. A combination of design, construction, operation, and end-of-life measures have been adopted to ensure the Proposed Development is mitigating negative impacts and utilising a circular economy at every stage.

Appendices

Appendix A - Proposed Site Plan



Appendix B - Circular Economy Workshop Meeting Notes

CE workshop	Date: 08.05.2025	Attendees: Alex Kuropatwa (Kuropatwa Ltd) Lamya Salem (SRE)	Carried out by: Lamya Salem (SRE)
Information Required		Comments	
Client information	Name	Stoney Wood Property Developments Ltd	-
	Address	32 Tavistock Street, London	-
Project information	Address	Stoney Wood Quarter, the Fairway, London, NW7	-
	Project type	New Construction	-
	Scope of works	WLCA & CE	-
Project team and appointments	Architect / designer	London Placemaking	-
	Structural engineer	MBP (Michael Barclay Partnership LLP)	-
	MEP	Irvineering	-
	Main Contractor	-	Project team confirmed the Main Contractor is to be appointed after planning
	Demolition contractor	N/A	Project team confirmed no demolition will occur on-site.
Building information	Building type(s)	Residential	Redevelopment of the site for use as residential (Class C3), in new buildings up to ground plus 5 storeys in height including plant, play space, car and cycle parking, hard and soft landscaping and all other works associated with the development.
	Location	London Borough of Barnet	-
	GIFA (m2)	55,082	Area as confirmed by Architect

Information Required			Comments
Assessments	BREEAM? (If yes, what scheme & version, and what credits are being targeted?)	N/A	-
	Building in Layers appraisal / assessment	N/A	-
	Excavation materials options assessment	Details requested	Some of the excavated material will be used for backfilling. Quantities will be confirmed at a later stage.
Documentation available	Floor plans	Revit Model received from the Architect	-
	Site plan	Received - included in the Appendix of the report	-
	Pre-Demolition audit	N/A	Project team confirmed no demolition will occur on-site.
	Site Waste Management Plan (SWMP) including a waste forecast (from excavation, demolition and construction)	Confirmation required	Project team confirmed that a Site Waste Management Plan has not yet been produced. Client commitment letter with the content of the SWMP that needs to be covered in the report is provided as an appendix to the Circular Economy report as an evidence of commitment to undertake the SWMP.
	Resource Management Plan (RMP) outlining all site requirements with regards to energy, water and waste (expected consumption and targets)	Confirmation required	Project team confirmed that a Resource Management Plan has not yet been produced, but confirmed that energy, water and waste usage and production will be monitored. Client commitment letter with the targets of the RMP is provided as an appendix to the Circular Economy report as an evidence of commitment to undertake the RMP.

Information Required			Comments
Design	M&E Design	MEP Initial assumptions?	• Mechanical Ventilation and Heat Recovery (MVHR) is to be installed within the residential units. • Comfort cooling (Natural ventilation) is to be used throughout the development. • Anticipated that the plant room is to be located on the ground floor – installation of the plant within the basement is to be avoided for safety reasons, if possible. This will not be confirmed until the MEP Consultant is appointed. • An electrical system has been considered, but there are no further details proposed as of yet – SAP modelling will be undertaken to drive this decision. • Installation of an Air Source Heat Pump has been considered for heating of the development (cooling of up to 10 degrees) – this is still to be confirmed.
	Does the project comply with Guidelines of the Local Council	Confirmation required	Project will comply London Plan 2021 and Barnet Local Plan (2021–2036)
	Are any LZC / renewable technologies included?	Roof PV - Area/Quantity?	PV will be located on the rooftop of the building. Area to be confirmed at a later stage.
	Information about bins, skips, waste storage area, waste collections (during the project)	Area for refuse space?	Refuse space to be provided on ground floor, with segregation of different waste streams. Area to be confirmed.
	Information about bins, skips, waste storage area, waste collections (during operation)	Internal / external if applicable	Operational waste collection area to be confirmed.
Opportunities for circularity and waste reduction	Reuse of materials and elements onsite	Request Details	No available materials
	Reuse of materials and elements offsite	Request Details	Recycled crushed material (Type 1) for hardstanding and piling mat

Information Required			Comments
Opportunities for circularity and waste reduction	Discuss designing for adaptability and disassembly – including any scenario modelling	Request Details	The client does not anticipate that the building will require re-purposing or requiring a change of use throughout its lifetime. The use of a reinforced concrete framed construction is a key factor on ensuring that the internal space remains as flexible as possible in the future, allowing the internal layout to be repurposed in the future to meet changing local needs.
	Discuss how the scheme can go above and beyond standard commitments	Standard practice of fly ash of 20%, structural steel 20% recycled content, aluminium 35% recycled content	Project team confirmed that they will maximize construction material with recycled content, including steel reinforcement with 97% recycled content. Glazing frames are confirmed to be aluminium.
Additional information	Energy targets	(if this is not included in SWMP/RMP)	Project team confirmed that SWMP produced will include energy targets. Commitment letter provided.
	Water targets	(if this is not included in SWMP/RMP)	Project team confirmed that SWMP produced will include watery targets. Commitment letter provided.
	Waste targets - waste produced / waste reduction	(if this is not included in SWMP/RMP)	Project team confirmed that SWMP produced will include waste targets. Commitment letter provided.
	Waste diverted from landfill target	(if this is not included in SWMP/RMP)	Project team confirmed that SWMP produced will include diversion from landfill targets. Commitment letter provided.
Other	Does the scope of our appointment include the provision of a Post Completion Report?		Client commitment letter provided.
	Note to client: ensure all targets and commitments are included in tender documents and contracts of future appointments (e.g. sub-contractors, waste contractors etc.)		

Appendix C - Tender Commitments Letter

FAIRWAY BARNET LTD

SWQ DEVELOPMENT MANAGEMENT

08 May 2025

SRE Ltd
3 London Square
Cross Lanes
Guildford
GU1 1UJ

Dear SRE,

Re: Stoney Wood Quarter, the Fairway, London, NW7

Site Waste Management Plan

Fairway Barnet can confirm that a Site Waste Management Plan will be developed for the site. In line with the commitments made in the Circular Economy Report produced by SRE, this plan will cover non-hazardous waste materials from on-site construction and dedicated off-site manufacture or fabrication, including demolition and excavation waste and accurate data records on waste arisings and waste management routes.

The SWMP will cover as a minimum:

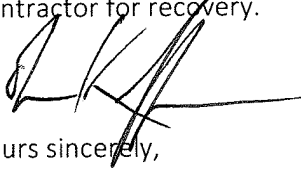
- Estimated volumes and types of waste produced by the development.
- The size and location of waste and recycling stores, and how the waste will be delivered to these facilities.
- The size and quantity of containers for waste.
- Any proposed separate collection point, and the method for transferring waste to this location.
- A target benchmark for resource efficiency
- The procedures and commitments for minimising hazardous and non-hazardous waste in line with the target benchmark
- The procedures for minimising hazardous waste
- A waste minimisation target and details of waste minimisation actions to be undertaken
- Procedures for estimating, monitoring, measuring and reporting hazardous and non-hazardous site waste. If waste data is obtained from licensed external waste contractors, the data will be reliable and verifiable (using data from EA/SEPA/EA Wales/NIEA Waste Return Forms)
- Procedures for sorting, reusing and recycling construction waste into defined waste groups either on-site or through a licensed external contractor
- Procedures for reviewing and updating the plan
- The name or job title of the individual responsible for implementing the above.

*Fairway Barnet is a Limited Company Registered in England and Wales. Company Number 15535828
Registered Office: 32 Tavistock Street, London, WC2E 7PB*

FAIRWAY BARNET LTD

SWQ DEVELOPMENT MANAGEMENT

Fairway Barnet can confirm that the Main Contractor appointed will be instructed to organise waste materials into separate key waste groups as per the attached table (according to the waste streams generated by the scope of the works) either on-site or through a licensed contractor for recovery.



Yours sincerely,

Oliver Kuropatwa

FAIRWAY BARNET LTD

SWQ DEVELOPMENT MANAGEMENT

European Waste Catalogue	Key group	Examples
170102	Bricks	Bricks
170101	Concrete	Pipes, kerb stones, paving slabs, concrete rubble, precast and in situ
170604	Insulation	Glass fibre, mineral wool, foamed plastic
1501	Packaging	Paint pots, pallets, cardboard, cable drums, wrapping bands, polythene sheets
170201	Timber	Softwood, hardwood, board products such as plywood, chipboard, medium density fibreboard (MDF)
1602	Electrical and electronic equipment	Electrical and electronic TVs, fridges, air-conditioning units, lamps equipment
200301	Canteen/office	Office waste, canteen waste, vegetation
1301	Oils	Hydraulic oil, engine oil, lubricating oil
1703	Asphalt and tar	Bitumen, coal tars, asphalt
170103	Tiles and ceramics	Ceramic tiles, clay roof tiles, ceramic, sanitary ware
1701	Inert	Mixed rubble/excavation material, glass
1704	Metals	Radiators, cables, wires, bars, sheet
170802	Gypsum	Plasterboard, plaster, fibre cement sheets
170101	Binders	Render, cement, mortar
170203	Plastics	Pipes, cladding, frames, non-packaging sheet
200307	Furniture	Tables, chairs, desks, sofas
1705	Soils	Soils, clays, sand, gravel, natural stone
Most relevant EWC	Liquids	Non-hazardous paints, thinners, timber treatments
Most relevant EWC	Hazardous	Defined in the Hazardous Waste List (HWL) of the European Waste Catalogue (EWC)
Most relevant EWC	Floor coverings (soft)	Carpets, vinyl flooring
Most relevant EWC	Architectural features	Roof tiles, reclaimed bricks, fireplaces
170904 (Mixed)	Mixed/other	Efforts should be made to categorise waste into the above categories wherever possible.

FAIRWAY BARNET LTD

SWQ DEVELOPMENT MANAGEMENT

08 May 2025

SRE Ltd
3 London Square
Cross Lanes
Guildford
GU1 1UJ

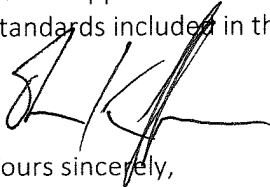
Dear SRE,

Re: Stoney Wood Quarter, the Fairway, London, NW7

Fairway Barnet can confirm that all targets and commitments stated within the Circular Economy Report for the Proposed Development will be included within the tender documents and contracts of future appointments (e.g. Main Contractor, Demolition Contractor, Excavation Contractor, sub-contractors, etc.).

During the tender process, responsibility will be assigned to an individual for monitoring, recording and reporting energy use, water consumption and transportation data (where measured) resulting from all on-site construction processes throughout the build program. To ensure the robust collection of information, this individual will have the appropriate authority and responsibility to request and access the data required – for instance, the Main Contractor.

Future appointments will only be made where confirmation is received from the party that the standards included in the tender documents are acknowledged and committed to.



Yours sincerely,

Oliver Kuropatwa

Appendix D - Recycling and Waste Reporting Table

Total estimates of waste					Waste management route						Summary			
Type of Waste	Source of information	Overall waste (tonnes)	Overall waste (tonnes/m ² GIA)	Performance Indicator (LPG Appendix x 1)	Reuse onsite (%)	Reuse offsite (%)	Recycle onsite (%)	Recycle offsite (%)	To landfill (%)	To other management (%)	Total reuse (%)	Total recycle (%)	Total reuse and recycle (%)	Total waste reported (%)
PRODUCT AND CONSTRUCTION STAGE (MODULE A)														
1	Demolition													
2	Excavation													
3	Construction													
USE STAGE (MODULE B)*														
3	Demolition / Strip-out													
4	Construction													
Type of Waste	Source of information	Overall waste (tonnes/annum)	Overall waste (tonnes/annum/m ²)	Performance indicator (LPG Appendix x 1)	Reuse onsite (%)	Reuse offsite (%)	Recycle onsite (%)	Recycle offsite (%)	To landfill (%)	To other management (%)	Total reuse (%)	Total recycle (%)	Total reuse and recycle (%)	Total waste reported (%)
5	Municipal													
6	Industrial (if applicable)													
MODULE A – MODULE C*														
	Source of information	Overall materials (tonnes)	Overall materials (modules A-C) (tonnes/m ²)	-	Reuse onsite (%)	Reuse offsite (%)	Recycle onsite (%)	Recycle offsite (%)	To landfill	To other management (%)	Total reuse (%)	Total recycle (%)	Total reuse and recycle (%)	Total waste reported (%)
7	Total materials													

Appendix E - Recycled Content Detailed Calculations

Material	Quantity	Unit Cost (£)	Total Cost (£)	Recycled Content (%)	Recycled Content (Kg)	Cost of Recycled Content (£)
Substructure						
Reinforcement steel (rebar), generic, 97% recycled content (typical), A615 (One Click LCA)	856,749.00	0.57	488,346.93	97%	831,046.53	473,696.52
Ready-mix concrete, PAV2, 15% Cement replacement with fly ash	1,567,766.00	0.05	78,388.30	2%	29,395.61	1,469.78
Frame						
Ready-mix concrete, RC 40/50 (40/50 MPa), 25% Cement replacement with blast furnace slag (GGBS)	11,446,631.00	131.67	1,507,177,903.77	3%	357,134.89	47,023,950.60
Reinforcement steel (rebar), 97% recycled content	1,219,836.00	0.57	695,306.52	97%	1,183,240.92	674,447.32
Upper Floors						
Gypsum plaster board, regular, generic, 6.5-25 mm	337,220.00	2.3	775,606.00	3%	10,116.60	23,268.18
Glass wool insulation in bats or rolls, unfaced, L = 0.035 W/mK, 50% recycled glass content	114,406.00	4.54	519,403.24	50%	57,203.00	259,701.62
Profiled steel decking for composite floor slabs/decking	11,870.00	11.25	133,537.50	70%	8,309.00	93,476.25
Galvanized profiled steel decking, for composite floor slabs	18,602.00	9	167,418.00	70%	13,021.40	117,192.60
Reinforcement steel (rebar), generic, 97% recycled content	603,014.00	0.57	343,717.98	97%	584,923.58	333,406.44
Roof						
Bitumen-polymer membrane roofing, 2 layer, mechanically fastning	4,917.00	6.88	33,828.96	50%	2,458.50	16,914.48
Gypsum plasterboard, fire resistant, 15.4x900/1200 mm	18.00	6.5	117.00	25%	4.50	29.25
Stone wool (mineral wool) insulation, unfaced	10,988.00	4.85	53,291.80	18%	1,961.36	9,512.59
Steel sheets, generic, 60% recycled content	7,174.00	6.92	49,644.08	60%	4,304.40	29,786.45

Material	Quantity	Unit Cost (£)	Total Cost (£)	Recycled Content (%)	Recycled Content (Kg)	Cost of Recycled Content (£)
Glass wool insulation, 35 mm, 0.035 W/mK, 630 g/m2	4,030.00	45.37	182,841.10	54%	2,176.20	98,734.19
External Walls						
Gypsum plasterboard with tapered or square edges, fire resistant	111,744.00	10.83	1,210,187.52	25%	27,936.00	302,546.88
Aluminium façade cladding panel, powder coated, 4.5 kg/m2	64,832.00	11.5	745,568.00	70%	45,382.40	521,897.60
Aluminium framed stick curtain wall system with clear float glass insulating unit	758,113.00	11.5	8,718,299.50	8%	64,212.17	738,439.97
Windows & External Walls						
Aluminium framed double glazed doors, per m2, 79.5% glass	6,105.00	10.2	62,271.00	12%	719.17	7,335.52
Wooden doorleaf, 0.838x1.981 m, 8.8 kg/m2 (JELD-WEN)	390.00	9.35	3,646.50	21%	80.73	754.83
Aluminium frame window, double glazing, non-operable	32,035.00	11.5	368,402.50	7%	2,370.59	27,261.79
Aluminium framed unitized curtain wall system with coated glazing	19,835.00	11.5	228,102.50	12%	2,374.25	27,303.87
Single glass pane, excluding frame, 7 mm/m2, 17.5 kg/m2	18,294.00	2.25	41,161.50	30%	5,488.20	12,348.45
Hot rolled austenitic stainless steels, 0.3-13 mm, 7900 kg/m3	473.00	6.64	3,140.72	84%	399.21	2,650.77
Internal Walls & Partitions						
Adaptable walls with fabric-coated panels, 5m x 2.9m, 27 kg/m2	270.00	7.5	2,025.00	16%	43.50	326.23
Concrete masonry unit (CMU), 198 kg/m2, Synerg-Eco	2,916,005.40	0.18	524,880.97	22%	644,437.19	115,998.69
Gypsum plaster board, 50% recycled, generic, 6.5-25 mm	866,340.21	2.3	1,992,582.48	50%	433,170.11	996,291.24
Glass wool insulation in bats or rolls, unfaced, L = 0.035 W/mK, 50% recycled glass content	94,254.73	10.21	962,340.79	50%	47,127.37	481,170.40
Internal Doors						
Wooden door with kraft paper facing, 110 kg/unit (Aspex)	1,320.00	15	19,800.00	37%	484.44	7,266.60

Material	Quantity	Unit Cost (£)	Total Cost (£)	Recycled Content (%)	Recycled Content (Kg)	Cost of Recycled Content (£)
Finishes						
Raised flooring panel with particle board core in a galvanised steel	745.00	1.4	1,043.00	100%	745.00	1,043.00
Woven wall-to-wall carpet, PA 6, textile fabric backing	18.00	2527.35	45,492.30	25%	4.50	11,373.08
Suspended metal ceiling system, 5.212 kg/m2, SAS System	3,196.00	5.92	18,920.32	22%	712.07	4,215.45
Aluminium entrance matting, 12.2 kg/m2 (One Click LCA)	3,721.00	3.6	13,395.60	55%	2,046.55	7,367.58
Emulsion for interior use with recycled paint content	570.00	1.2	684.00	35%	199.50	239.40
FFE						
Laminated ply table, 2000 x 1000 mm, 49.59 kg/unit	9,438.00	2.3	21,707.40	50%	4,719.00	10,853.70
Decorative plastic panels from 100% recycled rHIPS, 12 mm	10,365.00	3.5	36,277.50	100%	10,365.00	36,277.50
Bamboo cubical, 163.69 kg/unit, Mivera (Maxwood Washrooms)	10,421.00	2.4	25,010.40	4%	383.49	920.38
Steel drawer units for office, 74 kg/unit, LateralFile™	7,234.00	1.6	11,574.40	39%	2,785.09	4,456.14
Steel cupboards with double skin doors, 45 kg/unit (Bisley)	4,446.00	2	8,892.00	62%	2,747.63	5,495.26
Wooden wardrobe, 72.9 kg/unit (Bisley)	13,950.00	1.4	19,530.00	47%	6,584.40	9,218.16
Prefabricated dormer from GRP, softwood and polyurethane	3,817.00	2.75	10,496.75	9%	344.29	946.81
Glass coffee table with wooden legs, diameter: 410 mm	3,713.00	4.2	15,594.60	50%	1,856.50	7,797.30
Height adjustable standing desk with medium density fibreboard	21,607.00	1.6	34,571.20	50%	10,803.50	17,285.60
Kitchen cabinet, H: 900 mm, D: 600 mm, W: 600 mm, 44 kg/unit	40,269.00	2.5	100,672.50	50%	20,134.50	50,336.25
Office swivel chair, 17 kg/unit (One Click LCA)	30,427.00	5.5	167,348.50	50%	15,213.50	83,674.25
Student desk with particleboard worktop and steel legs	2,650.00	1.4	3,710.00	50%	1,325.00	1,855.00
Table with round veneered medium density fibreboard top	197.00	1.6	315.20	50%	98.50	157.60
Two-seat sofa with steel legs, H: 790 mm, D: 890 mm	46,051.00	4	184,204.00	50%	23,025.50	92,102.00

Material	Quantity	Unit Cost (£)	Total Cost (£)	Recycled Content (%)	Recycled Content (Kg)	Cost of Recycled Content (£)
Wardrobe from medium density particleboard, H: 2323 mm	59,904.00	1.2	71,884.80	50%	29,952.00	35,942.40
Aluminium base office chair, 20.63 kg/unit, Aeron Chair	107.00	8.7	930.90	67%	71.69	623.70
Plastic work chair, 16.64 kg/unit, Verus (Herman Miller)	87.00	6.6	574.20	18%	15.66	103.36
Services						
Galvanized steel ventilation duct, circular, DN 100 mm	2,369.00	1.43	3,387.67	70%	1,658.30	2,371.37
Steel storage with sliding doors, 120 kg/unit, Glide	749.00	1.75	1,310.75	62%	462.88	810.04
Hot dip galvanized steel, 0.73 mm, 5.72 kg/m2, EN15804+A1	8,278.00	1.15	9,519.70	70%	5,794.60	6,663.79
External Works						
Asphalt, generic, compacted, 5/95% bitumen-aggregate ratio	31.00	0.07	2.17	20%	6.20	0.43
Ready-mix concrete, normal-strength, generic, C30/37	9,615.00	25.24	242,682.60	1%	96.15	2,426.83
Reinforcement steel (rebar), generic, 97% recycled content	258.00	0.57	147.06	97%	250.26	142.65
Steel access ramp, 46.72 kg/m2 (Rapid Ramp Ltd)	5,036.00	2.45	12,338.20	70%	3,525.20	8,636.74
Total Cost of Recycled Content						52,800,514.86

Appendix F - SRE Assumptions

Class	Material
FOUNDATION	Reinforcement steel (rebar), generic, 97% recycled content (typical), A615 (One Click LCA (2018))
FOUNDATION	Precast concrete retaining wall, incl. reinforcement, ep. 0.25m, C25/30 XC4 CEM II/A-S (SNBPE)
FOUNDATION	Retaining wall from natural stone, width 400 mm (16 in)
FOUNDATION	Clay brick, UK average production, 215 mm x 102.5 mm x 65 mm, 2.13 kg/unit, 1485 kg/m ³ (Brick Development Association (BDA) Ltd (2023))
FOUNDATION	Cement mortar (One Click LCA)
FOUNDATION	Ready-mix concrete, PAV2, 15% Cement replacement with fly ash
FLOOR	Polyethylene vapour barrier membrane, 0.15 mm, 0.14 kg/m ² (One Click LCA)
FLOOR	PUR rigid insulation panels with aluminium foil, paper and PET facing, R=7.4 m ² K/W, L=0.022 W/mK, 160 mm, 5.73 kg/m ² , Lambda=0.022 W/(m.K), EFITOIT® 160 mm (SOPREMA SAS)
FLOOR	Sand cleanliness per GFA, EN15804 A1/A2
FLOOR	Sand (One Click LCA)
BEAM	Reinforcement steel (rebar), generic, 97% recycled content (typical), A615 (One Click LCA)
BEAM	Ready-mix concrete, normal-strength, generic, C30/37 (4400/5400 PSI), 10% (typical) recycled binders in cement (300 kg/m ³ / 18.72 lbs/ft ³) (One Click LCA)
BEAM	Glass wool insulation, 35 mm, 0.035 W/mK, 630 g/m ² , 18 kg/m ³ , ISOVER KL/KT-35 Multi-Pack (Saint-Gobain)
BEAM	Polypropylene vapour membrane, French average, 0.18 kg/m ² (MDEGD)
BEAM	Glued laminated timber (Glulam) beams (Kjeldstad)
COLUMN	Reinforcement steel (rebar), generic, 97% recycled content (typical), A615 (One Click LCA (2018))
COLUMN	Ready-mix concrete, RC 40/50 (40/50 MPa), 25% Cement replacement with blast furnace slag (GGBS)
COLUMN	Ready-mix concrete, normal-strength, generic, C40/50 (5800/7300 PSI), 10% (typical) recycled binders in cement (400 kg/m ³ / 24.97 lbs/ft ³) (One Click LCA)
COLUMN	Ready-mix concrete, normal-strength, generic, C30/37 (4400/5400 PSI), S1 XC0/XC1, 10% (typical) recycled binders in cement (min cem. content: 280 kg/m ³ / 18.72 lbs/ft ³), Portland-fly ash cement CEM II/A-V 42.5 (One Click LCA (2024))
ROOF	Self-levelling mortar, for floors, walls and overhead appl., 3-50 mm, 1400 kg/m ³ , Pericret (PCI Augsburg)

Class	Material
ROOF	Concrete roof tiles, Avg. thickness per m2: 22.4 mm, 334x420 mm, 2100 kg/m3 (Eternit)
ROOF	Woven polypropylene geotextile, 0.11 kg/m2 (One Click LCA)
ROOF	Stone wool (mineral wool) insulation, unfaced, L = 0.031 W/mK, R = 1 m2K/W, 31mm, 1.86 kg/m2, 60 kg/m3, (Range: 51-65kg/m3), 22% slag content (One Click LCA)
ROOF	Waterproof, protective, flexible coating, 1.5 kg/l, Lastogum (PCI Augsburg)
ROOF	Steel sheets, generic, 60% recycled content, S235, S275 and S355 (One Click LCA)
ROOF	Roofing tile from clay (terracotta), flat (shingles), 285 x 475 mm (11.2 x 18.7 in), 10 pcs/m2, 3.5 kg/pcs, 35 kg/m2 (One Click LCA)
ROOF	Steel roof cladding system with glass mineral wool insulation, U = 0.24 W/m2K, 201.25 mm, 15.54 kg/m2, River-Therm® Secret Fix (Tata Steel and CA Building Products)
ROOF	PUR insulation panel for pitched roof, multi-layer composite facing, L=0.022 W/mK, R=4.65 m2K/W, 103 mm, 3.77 kg/m2, Lambda=0.022 W/(m.K), Eurotoit® MONTAGNE 103 mm (RECTICEL INSULATION SAS)
ROOF	Steel roof cladding system with glass mineral wool insulation, U = 0.16W/m2K, 281.4 mm (Total), 0.70 mm (Outer sheet), 0.70 mm (Liner sheet), 280 mm (Insulation), 16.29 kg/m2, Elite 2 (Tata Steel, Euroclad Group Ltd)
ROOF	Green roof assembly, with timber joists
ROOF	Stone wool (mineral wool) insulation, unfaced, L = 0.0315 W/mK, R = 1 m2K/W, 31.5mm, 1.26 kg/m2, 40 kg/m3, (Range: 36-50kg/m3), 22% slag content (One Click LCA)
ROOF	Extensive green roof system, 40mm, 23.34 kg/m2, Urbanspace (Knauf)
ROOF	Bitumen-polymer membrane roofing, 2 layer, mechanically fastened (EWA)
SLAB	Wooden interior cladding, for UK
SLAB	Wood interior door
SLAB	Ready-mix concrete, RC40/50 with average UK additions cement
SLAB	EPDM waterproofing roof membrane, 1.2 mm, 1.57 kg/m2, HERTALAN® EASY COVER FR (Carlisle Construction Materials B.V.)
SLAB	Ready-mix concrete, RC40/50 with average UK additions cement
SLAB	Profiled steel decking for composite floor slabs/decking, 1.25 mm sheet thickness, 600 mm width, 16.31 kg/m2, ComFlor 210 1.25mm steel structural floor deck (Tata Steel)
SLAB	Galvanized profiled steel decking, for composite floor slabs/decks, 1 mm sheet thickness, 12.83 kg/m2, ComFlor® 80 1.0mm with Colorcoat FD® 170 (Tata Steel Europe (2021))
SLAB	Wooden joist floor assembly, 278 mm, incl. 225 mm mineral wool insulation, with updated OCL generic data

Class	Material
SLAB	Waterproofing roofing system incl. insulation and concrete tiles, for UK
SLAB	Floor slab, timber joists, P2 R30 (1...2 krs.) (Large school), incl. One Click LCA generic data
STAIRS	Parquet
STAIRS	Laminated timber
FINISH	Cementitious floor leveling screed, 10-250 mm, 1.8 kg/m2/mm, 1.6–1.8 kg/l, webervetonit 6000 Rapid Screed (Saint-Gobain Finland Oy)
FINISH	Weber floor smoothing screed, 5-50mm layer thickness, 34 kg/m2, vetonit 130 Core (weber.)
FINISH	Reinforcement mesh fabric (glass fibre), 0.16kg/m2, R131 (ADFORS)
FINISH	Plywood, generic, 4-50 mm (0.16-1.97 in), 620 kg/m3 (38.7 lbs/ft3) (One Click LCA)
FINISH	Dried lumber from spruce or pine wood, 474 kg/m3, moisture content 18 % (Puutuoteteollisuus)
FINISH	Planed timber, conifer (Treindustrien)
FINISH	Gypsum plaster board, regular, generic, 6.5-25 mm (0.25-0.98 in), 10.725 kg/m2 (2.20 lbs/ft2) (for 12.5 mm/0.49 in), 858 kg/m3 (53.6 lbs/ft3), 0% recycled gypsum (One Click LCA)
FINISH	Planed timber, conifer (Treindustrien)
FINISH	Gypsum plasterboard, windproofing, vapour resistant sheathing, 9.5x900/1200 mm, 7.2 kg/m2, Vindskydd, GUE/GU9 (Gyproc)
FINISH	Laminated veneer lumber (LVL), 9% moisture content, 510 kg/m3 (Stora Enso)
FINISH	Fiberglass reinforcing mesh, 0.145 kg/m2, Treillis d'armature en fibre de verre (DONNEE ENVIRONNEMENTALE GENERIQUE PAR DEFAULT)
FINISH	Particleboard, uncoated, 8 - 48 x 590 - 2850 x 1025 - 6250 mm, 611 kg/m3 (Sonae Indústria)
FINISH	PVC floor covering, 4.5 mm, 5.003 kg/m2, Art Select, Monet, Van Gogh, Opus, Rubens, Michelangelo, HDC (Karndean)
FINISH	Aluminium entrance matting, 12.2 kg/m2 (One Click LCA)
FINISH	Emulsion for interior use with recycled paint content, 0.168 kg/m2, 1.4 kg/l, Dulux Trade Evolve Matt (AkzoNobel, plant Prudhoe)
FINISH	Gypsum plasterboard, fire resistant, 15.4x900/1200 mm, 12.7 kg/m2, PROTECT F, GFE/GF15 (Gyproc)
FINISH	Cross laminated timber (CLT), 481 kg/m3, 12% ($\pm$ 3%) moisture content (One Click LCA)
FINISH	Gypsum plaster, from 100% natural gypsum, in powder form (One Click LCA)

Class	Material
FINISH	Glass fibre reinforced plasterboard
FINISH	Wall sandwich panels, 100 mm, U = 0.19 W/Km2, 12.654 kg/m2, Quadcore Evolution (Kingspan (2021))
FINISH	Terracotta brick with hollow chambers, for facade application, 30 mm thickness, 237.5-500 mm height, up to 1500 mm lengths, 42 kg/m2, 2200 kg/m3 (One Click LCA)
DOOR	Wooden and engineered wood interior doors, biogenic CO2 not subtracted, 485-1360 mm x 1597-2735 mm, min. thickness 39 mm, 41 kg/m2 (VHI)
DOOR	Softwood lath (stud), kiln dried, sawn, 440 kg/m3, 10% moisture content, coniferous wood (One Click LCA)
DOOR	Joinery strip seal, 2.75E-3 kg/ml, Fabricant Références commerciales ISO CHEMIE SO-ZELL FOND DE JOINT SIKA FOND DE JOINTS SIKA TRAMICO TRAMICORD TREMCO ILLBRUCK AZ102 FOND DE JOINT PE/PR102 CORDE PE (SFJF DTSB)
DOOR	Window - uPVC frame DG
DOOR	High pressure laminate (HPL), 1 mm, 1.5 kg/m2, 1500 kg/m3 (One Click LCA)
DOOR	Single glass pane, excluding frame, 7 mm/m2, 17.5 kg/m2
DOOR	Hot rolled austenitic stainless steels, 0.3-13 mm, 7900 kg/m³, Lambda=15 W/(m.K), 304, 304D, 304ED, 304H, 304L, 304M, 304LN (Aperam)
DOOR	Hot-dipped zinc/iron alloy-coated steel, Base Metal Thickness (BMT): 1.15 mm, 9.13 kg/m2, Metallic Coating ZF100, ZINCANNEAL (BlueScope Steel Limited)
DOOR	Stainless steel door handle, 1.69 kg/unit (ASSA ABLOY)
DOOR	Wooden interior door, per m2, 809x2053 mm, 42x92 mm frame, 52 mm door leaf (Nordic Dørfabrikk)
DOOR	Rubber floor tiles, 965.2 mm x 965.2 mm, 10 mm, 9.295 kg/m2 (Average), Next Step® (Luxury) - Square Cut, Interlocking (Dinoflex)
DOOR	External door, for Finland
DOOR	Oriented strand board (OSB), 8-30 mm (Nordboard, from Inverness mill)
DOOR	Multifunctional steel door, product group 1, 1000mm x 2125 mm, H 3 D, H 3 OD, H 3 VM, H 3 KT, RS 55, D 65 OD, D 65 (Hörmann)
DOOR	Single glazed window, incl. aluminium frame
DOOR	Float glass, single pane, generic, 3-12 mm (0.12-0.47 in), 10 kg/m2 (2.05 lbs/ft2) (for 4 mm/0.16 in), 2500 kg/m3 (156 lbs/ft3) (One Click LCA)
DOOR	Extruded aluminium profiles for window and door frames, generic, 0% recycled content, average world aluminium manufacturing technology (One Click LCA)

Class	Material
DOOR	Oriented strand board (OSB), 8-30 mm (Nordboard, from Inverness mill)
DOOR	Wooden doorleaf, 0.838x1.981 m, 8.8 kg/m ² (JELD-WEN)
WINDOW	Aluminium framed double glazed doors, per m ² , 79.5% glass, 15.7% aluminium, 2.2% steel, 44 kg/m ² , width:1.23m, height:2.18m, 6mm toughened and 8.8mm laminated glass, Edge Symmetry (Optima)
WINDOW	PVC framed window double-glazed, operable, 1.23 m x 1.48 m, 26.3 kg/m ² (One Click LCA)
WINDOW	Toughened glass, excluding frame, 15 mm/m ² , 37.5 kg/m ²
WINDOW	High pressure laminate (HPL), 1 mm, 1.5 kg/m ² , 1500 kg/m ³ (One Click LCA)
WINDOW	Multi-layer safety glass, excluding frame, 16 mm/m ² , 40 kg/m ²
WINDOW	Float glass, 6 mm, 15 kg/m ² , 2500 kg/m ³ , PLANICLEAR® 5 mm, PLANICLEAR® 6 mm, DIAMANT® 5 mm, DIAMANT® 6 mm (SAINT-GOBAIN GLASS FRANCE)
WINDOW	Aluminium frame window, double glazing, non-operable, 22.88 kg/m ² , 1.48 x 2.18 m, SlimLine 38 window –type LDN (Reynaers Aluminium)
EXTERNAL WALL	Glass wool insulation in bats or rolls, unfaced, L = 0.035 W/mK, R = 2.86 m ² K/W, 100 mm, 2.75 kg/m ² , 27.5 kg/m ³ , (Range: 20-35kg/m ³), 50% recycled glass content (One Click LCA)
EXTERNAL WALL	Treated wooden cladding, generic, 15-40 mm (0.59-1.57 in), 9.75 kg/m ² (1.99 lbs/ft ²)(for 15 mm/0.59 in), 525 kg/m ³ (32.8 lbs/ft ³), min. G4-1 (One Click LCA)
EXTERNAL WALL	Aluminium framed unitized curtain wall system with coated glass insulating unit, double glazed, 4-16-4, 50.3 kg/m ² , 70% recycled aluminium (One Click LCA)
EXTERNAL WALL	Medium density concrete block, 440x140x215, 217 kg/m ² , 10.4N 140, L14010 (Lignacite Ltd)
EXTERNAL WALL	Gypsum plasterboard with tapered or square edges, fire resistant, 12.5 mm, 10.2 kg/m ² , L= 0.190 W/m.K, Fire resistance class : A2-s1, d0, Lambda=0.19 W/(m.K), Gyproc FireLine (Saint-Gobain Construction Products UK Limited t/a British Gypsum (2024))
EXTERNAL WALL	Mortar, Mortar (1:5), Uses the general UK average cement mixture
EXTERNAL WALL	Fiberglass insulation in batts, faced, R-5.68 (Rsi=1 m ² K/W), 1.416 kg/m ² , Unfaced Fiberglass, Kraft Faced Fiberglass, Panel Deck FSK-25, FSK-25, ComfortTherm®, Cavity-SHIELD™ (Johns Manville)
EXTERNAL WALL	Render - Sand and cement
EXTERNAL WALL	Sandwich panel with stone wool core and steel facing, 175 mm, 27.3 kg/m ² , Firemaster (Euroclad Group)
EXTERNAL WALL	Window, 0.63 W/m ² K, 46.5 kg, 1.23x1.48 m, type AT450E (H-vinduet Magnor)
EXTERNAL WALL	Lightweight brick effect cladding system, 4-6 mm, 5.8 kg/m ² , A2-S1, d0, weberwall brick (Saint-Gobain Construction Products UK Limited t/a Weber)

Class	Material
EXTERNAL WALL	Aluminium framed stick curtain wall system with clear float glass insulating unit, double glazed, 4-16-4, 36.4 kg/m ² , 50% recycled aluminium (One Click LCA)
EXTERNAL WALL	Granite interior wall cladding, for UK
EXTERNAL WALL	Granite for interior and exterior coating of pavements, floors, walls and facades, 30 mm, 2671 kg/m ³ , Nordico (CLÚSTER DEL GRANITO)
EXTERNAL WALL	Aluminium façade cladding panel, powder coated, 4.5 kg/m ² , 70% recycled content (One Click LCA)
EXTERNAL WALL	Tile adhesive, all round, for ceramics, 1-5 mm, 1400 kg/m ³ , Verlegemörtel (PCI Augsburg)
EXTERNAL WALL	Lightweight aggregate (LECA) block internal wall assembly, incl. render, 180 mm, for UK
EXTERNAL WALL	Finishing wall mortars, French average, 3 mm, 4.2 kg/m ² , Mortiers de ragréage muraux (DONNEE ENVIRONNEMENTALE GENERIQUE PAR DEFAUT)
EXTERNAL WALL	Concrete masonry unit (CMU) hollow core from lightweight concrete, 6x8x16 inch (150x200x400mm), 105lbs/ft ³ (1680 kg/m ³) (concrete density), 20.2 lbs (9.16 kg)/unit (One Click LCA)
EXTERNAL WALL	Masonry mortar, light, 1000 kg/m ³ (quick-mix)
EXTERNAL WALL	Finishing wall mortars, French average, 3 mm, 4.2 kg/m ² , Mortiers de ragréage muraux (DONNEE ENVIRONNEMENTALE GENERIQUE PAR DEFAUT)
INTERNAL WALL	Granite for interior and exterior coating of pavements, floors, walls and facades, 30 mm, 2671 kg/m ³
INTERNAL WALL	Finishing wall mortars, French average, 3 mm, 4.2 kg/m ²
INTERNAL WALL	Concrete masonry unit (CMU), 198 kg/m ² , Synerg·Eco
INTERNAL WALL	Planed timber, conifer
INTERNAL WALL	Glass wool insulation in bats or rolls, unfaced, L = 0.035 W/mK, 100 mm, 2.75 kg/m ² , 50% recycled glass content
INTERNAL WALL	Oriented strand board (OSB), 8-30 mm
INTERNAL WALL	Adaptable walls with fabric-coated panels, 5m x 2.9m, 27 kg/unit, Adaptable Walls
INTERNAL WALL	Gypsum plaster board, regular, 50% recycled gypsum, 6.5-25 mm
OTHER	Concrete staircase, U-shaped, with no flat landing, width 140cm, 1928.2kg (CERIB)
OTHER	Steel access ramp, 46.72 kg/m ² (Rapid Ramp Ltd)
OTHER	Vinyl flooring sheet
OTHER	Timber - hardwood

Class	Material
OTHER	Suspended metal ceiling system, 5.212 kg/m ² , SAS System 150 (Steel) (SAS International)
OTHER	Concrete waste and storm water sewer with slope, Ø300, for normal or demanding conditions
F&F	Table with round veneered medium density fibreboard top, diameter: 800 mm, 21 kg/unit (One Click LCA)
F&F	Steel drawer units for office, 74 kg/unit, LateralFile™, SystemFile™, Essentials, Be™ (Bisley)
F&F	Chair, 16.3 kg/unit, Mirra® 2 (Herman Miller (UK))
F&F	Microwave, 280 x 402 x 212 mm (11.0 x 15.9 x 8.3 in), 17L capacity, 10.6 kg/unit (23.4 lbs/unit) (One Click LCA)
F&F	Wardrobe from medium density particleboard, H: 2323 mm, D: 606 mm, W: 2670 mm, 288 kg/unit (One Click LCA)
F&F	Steel storage with sliding doors, 120 kg/unit, Glide (Bisley)
F&F	Bamboo cubical, 163.69 kg/unit, Mivera (Maxwood Washrooms Ltd.)
F&F	Steel cupboards with double skin doors, 45 kg/unit (Bisley)
F&F	Kitchen cabinet, H: 900 mm, D: 600 mm, W: 600 mm, 44 kg/unit (One Click LCA)
F&F	Plastic work chair, 16.64 kg/unit, Verus (Herman Miller)
F&F	Aluminium base office chair, 20.63 kg/unit, Aeron Chair (Herman Miller (2022))
F&F	Glass coffee table with wooden legs, diameter: 410 mm, glass thickness: 6 mm, 10 kg/unit (One Click LCA)
F&F	Two-seat sofa with steel legs, H: 790 mm, D: 890 mm, W: 1840 mm, 60 kg/unit (One Click LCA)
F&F	Laminated ply table, 2000 x 1000 mm, 49.59 kg/unit, Type table (laminated ply) (MARK Product)
F&F	Decorative plastic panels from 100% recycled rHIPS, 12 mm, 3000x1200 mm, 49.7 kg/unit, Alba, Heron (Re-worked Ltd TA Smile Plastics)
F&F	Student desk with particleboard worktop and steel legs, W: 700 mm, L: 500 mm, 13 kg/unit (One Click LCA)
F&F	Stainless steel wall-hung urinal, 3.5 kg/unit, 420 x 280 x 290 mm (One Click LCA)
F&F	Laminated ply table, 2000 x 1000 mm, 49.59 kg/unit, Type table (laminated ply) (MARK Product)
SYSTEMS	Ventilation system for residential buildings, with updated OCL generic data
SYSTEMS	Elevator hoistway with floor door per floor, traction (cable) type, 251.36 kg/unit (USE ONLY WITH Passenger elevator car) (One Click LCA)
SYSTEMS	Galvanized steel ventilation duct, circular, DN 100 mm, (4 in), 1.3 kg/m, wall thickness: 0.5 mm (One Click LCA)

Class	Material
SYSTEMS	Switch button, 0.045 kg/unit (HAGER / HAGER SE)
SYSTEMS	Double two-way light switch, 0.036 kg/unit (One Click LCA)
SYSTEMS	Luminares, 0.365 kg/unit, ZTA.35 Pole clamp (Stoane Lighting)
SYSTEMS	Luminares, 0.95 kg/unit, 0.003 kW, V58S 3W/m 24VDC Opal Diffuser (Lumino Distribution)
SYSTEMS	Ball fitting and manifolds, DN 8, 0.12 kg/unit (One Click LCA)
SYSTEMS	Emergency exit light, French average, L.S.C + D.B.R (DONNEE ENVIRONNEMENTALE GENERIQUE PAR DEFAULT)
SYSTEMS	Autoclaved aerated concrete solid blocks, 150x200x300 mm (6x8x12 in), 600 kg/m ³ , 5.66 kg/unit (One Click LCA)
SYSTEMS	Data mounting plates, 0.012 kg/unit, (HAGER / HAGER SE)
SYSTEMS	Suspension bracket, 770 mm, 1.4706 kg/unit, FTB-770 (Gripple Ltd)
SYSTEMS	Switch master, 0.363 kg/unit, SpaceLogic KNX (SCHNEIDER ELECTRIC - ENERGY / SCHNEIDER ELECTRIC INDUSTRIES SAS)
SYSTEMS	Variable refrigerant flow (VRF), system indoor unit, 25 kg/unit, PEFY-M50VMA-A (Mitsubishi Electric)
SYSTEMS	Motion integrated drive, 24..36 V - CANopen DS301 - 5 A, 4.4 kg/unit, ILS1F851PB1F0 (Schneider Electric)
SYSTEMS	Outdoor unit for air/air heat pump, P=5.1 kW, 77 kg/unit (One Click LCA)
SYSTEMS	Electric vertical bathroom radiator, wall mounted, 14 kg/unit, 600W/unit (One Click LCA)
SYSTEMS	Three phase stepper motor, 3-phase stepper - 0.51 Nm - shaft $\varnothing$ 6.35 mm - L=42 mm - w/o brake, 1.3 kg/unit, BRS364H030ABA (Schneider Electric)
SYSTEMS	Miniature circuit breaker, 2P, C curve, 0.233 kg/unit, C9, 16A, 400V, C9F18216 (Schneider Electric)
SYSTEMS	Circuit breaker, MOLDED CASE 600V 150A, 2.2 kg/unit, NJDL36150 (Schneider Electric)
SYSTEMS	Linear suspended luminares, 8.887 kg/unit, 1600mm length, Selene 2 (Whitecroft Lighting Limited)
SYSTEMS	Headwall, reinforced concrete, XLarge, $\varnothing$ 1800 mm ($\varnothing$ 70 in)
SYSTEMS	Suspension bracket, 570 mm, 1.1406 kg/unit, FTB-570 (Gripple Ltd)
SYSTEMS	Indoor pendant lights, caramel finish, 500 h x 170 dia, 0,999 kg/unit, Hinaki 500 Caramel Finish (David Trubridge Limited (2020))
SYSTEMS	Prefabricated dormer from GRP, softwood and polyurethane foam, 193.39 kg/unit, Heritage Hipped Dormer 1810/1050/35° (Exallot Ltd)

Class	Material
SYSTEMS	Road lighting (3 materials), height 12 meters (39 ft), post diameter 152 mm (6 in)
SYSTEMS	Raised access flooring panels, chipboard in galvanized steel envelope, per unit, 600 x 600 mm, 11 kg/unit, RMG600 (Kingspan Access Floors)
SYSTEMS	Reinforcement steel (rebar), generic, 97% recycled content (typical), A615 (One Click LCA (2018))
SYSTEMS	Hot dip galvanized steel, 0.73 mm, 5.72 kg/m ² , EN15804+A1, ref. year 2018
SYSTEMS	Prefabricated dormer from GRP, OSB and polyurethane foam, 213.73 kg/unit, Heritage Flat-top Dormer 1810/1050/40° (Exallot Ltd)
SYSTEMS	Elevator for passenger use, 10031 kg/unit, MiniSpace™ DX (KONE)
SYSTEMS	Adaptable walls with fabric-coated panels, 5m x 2.9m, 27 kg/unit, Adaptable Walls (Optima Products Limited)
SYSTEMS	Raised flooring panel with particle board core in a galvanised steel envelope, 600x600x30 mm, 10.5 kg/unit, RMG600 (Kingspan Data and Flooring)
SYSTEM	Air handling unit (AHU), large single family house grade, 1000 m ³ /h (35000 cuft), 130 kg/unit (One Click LCA)
EXTERNAL WORK	Crushed gravel (One Click LCA)
EXTERNAL WORK	Asphalt layer, thickness 120 mm (5 in)
EXTERNAL WORK	Asphalt, generic, compacted, 5/95% bitumen-aggregate ratio, 2350 kg/m ³ (One Click LCA)
EXTERNAL WORK	Sett stone paving, 140x220x140 mm (5.5x8.7x5.5 in)
EXTERNAL WORK	Rectangular paving stone, Finnish average, 2700 kg/m ³ (KIVI ry)
EXTERNAL WORK	Concrete paving blocks, 80 mm, 154 kg/m ² , CORIO EcoTerra (METTEN Stein+Design)

Appendix G - Operational Waste Management Plan

STONEY WOOD QUARTER

Operational Waste Management Plan

Land north of The Fairway, London NW7 3HS
London Borough of Barnet

Prepared by:

London Placemaking
32 Tavistock Street, Covent Garden, London WC2E 7PB

On behalf of:

Stoney Wood Property Developments Ltd

November 2025

Document Control

Version	Date	Author	Status	Description
1.0	November 2025	London Placemaking	Planning	Initial issue

This Operational Waste Management Plan (OWMP) has been prepared by London Placemaking on behalf of Stoney Wood Property Developments Ltd in support of the detailed planning application for the Stoney Wood Quarter development. It should be read alongside the Design and Access Statement (November 2025) and all other documents submitted as part of the planning application.

1. Introduction

1.1 Purpose of this Document

This Operational Waste Management Plan (OWMP) sets out the approach to the storage, segregation, collection and management of refuse and recyclable waste arising from the Stoney Wood Quarter development once operational. It provides a comprehensive framework governing day-to-day waste handling for the 463 new residential homes, shared amenity spaces, and commercial uses (including the gym, café, co-working space, and community facilities) proposed on the site.

The OWMP has been prepared to:

- Demonstrate compliance with the London Borough of Barnet's waste and recycling requirements, as set out in the Local Plan, Waste and Recycling Strategy, and relevant Supplementary Planning Documents.
- Show alignment with the Mayor of London's London Plan (2021), including Policies SI7 (Circular Economy) and SI8 (Waste capacity and net self-sufficiency).
- Detail the underground proposed bin system proposed for the development and explain its suitability for this Build to Rent (BTR) context.
- Provide clear operational protocols for residents, the concierge management team, and the appointed waste collection contractor.
- Demonstrate that waste management will not give rise to adverse environmental, amenity or highway impacts.

1.2 The Development

Stoney Wood Quarter is a residential-led Build to Rent development comprising 463 new homes on a brownfield site north of The Fairway, Mill Hill, London NW7 3HS, within the London Borough of Barnet. The scheme is brought forward by Stoney Wood Property Developments Ltd.

The development is arranged across nine building blocks (A–I) and includes:

- 463 residential units comprising a mix of 1-bed, 2-bed, 3-bed, 4-bed and 5-bed apartments, maisonettes and townhouses
- 50% affordable housing (tenure-blind, pepper-potted throughout)
- Shared amenity provision including a gym, café, co-working space, indoor soft play area and clubhouse
- Extensive public realm with pedestrianised streets, pocket parks, play areas and woodland connections
- On-site concierge management

The scheme is designed as a professionally managed Build to Rent neighbourhood. The BTR operating model is central to the waste management strategy: a resident concierge will oversee day-to-day waste operations, ensuring the system functions effectively and maintains the high environmental standards of the public realm.

1.3 Policy and Regulatory Context

This OWMP has been informed by the following policy and regulatory framework:

National Policy

- National Planning Policy Framework (NPPF, 2023) — requires development to address waste management in support of a circular economy

- Waste (England and Wales) Regulations 2011 — establishes the waste hierarchy (prevention > reuse > recycling > recovery > disposal)
- Environment Act 2021 — introduces mandatory food waste collections and consistent recycling streams
- Building Regulations Part H — drainage and waste disposal requirements

London Plan (2021)

- Policy SI7: Circular Economy — development must minimise resource use and manage waste sustainably
- Policy SI8: Waste Capacity and Net Self-Sufficiency — supports net self-sufficiency in waste management within London
- Policy D3: Inclusive Design — ensuring waste storage and access is accessible to all
- GLA Circular Economy Guidance (2022)

London Borough of Barnet Local Policy

- Barnet Local Plan (2012, updated 2024) — Policy CS13 (Protecting and enhancing Barnet's open spaces) and DM04 (Environmental considerations for development)
- London Borough of Barnet Waste and Recycling Strategy

2. Waste Characterisation and Generation

2.1 Anticipated Waste Streams

The following waste streams will be generated by the development:

Waste Stream	Source	Collection Frequency
Residual (non-recyclable) waste	All residential units, amenity spaces, commercial uses	Weekly
Dry mixed recyclables (glass, cans, plastic, paper, card)	All residential units	Weekly
Food / organic waste	All residential units, café kitchen	Weekly
Bulky waste (furniture, white goods)	Residential units (move-in/move-out)	On request
Hazardous household waste	Residential units	By arrangement via LBB Hazardous Waste service
Electrical & electronic waste (WEEE)	Residential units and amenity areas	On request / designated collection events
Clinical waste	Potentially small number of residents	By specialist contractor if required
Commercial waste (gym, café, co-working)	Commercial units	Contracted separately to LBB or approved contractor

2.2 Waste Volume Calculation

Waste storage capacity has been calculated on a per-dwelling litre-allocation basis as set out in the Design and Access Statement (November 2025):

Unit Type	No. of Units	Residual Allocation (L)	Recycling Allocation (L)	Sub-total Residual (L)	Sub-total Recycling (L)
1-bed	167	100	100	16,700	16,700
2-bed	56	170	170	9,520	9,520
3-bed	229	240	240	54,960	54,960
4-bed/ 5-bed	11	310	310	3,410	3,410
TOTAL	463	—	—	84,590	84,590

Note: The residual total of 84,590L and recycling total of 84,590L confirms the requirement for 17 x 5,000L iceberg bins for residual waste and 17 x 5,000L for recycling — totalling 34 bins across the site. Each household will be provided with a 7-litre indoor food waste caddy.

2.3 Population Yield and Occupancy

Based on the GLA Population Yield Calculator (v3.2), the development is expected to accommodate approximately 1,079 residents at full occupancy. This figure has informed the waste generation assessment above and confirms that the proposed bin provision is appropriate and proportionate to the scale of the development.

3. Waste Storage — Iceberg Underground Bin System

3.1 System Overview

The proposed waste storage system for Stoney Wood Quarter is based on underground 'iceberg' bins, emptied by a HIAB-type refuse lorry. This approach has been selected as the primary waste storage solution for the development.

The system proposed is manufactured by Sulo, a leading European waste management solutions provider. The Sulo system is currently operational with other London boroughs, including the London Borough of Barking and Dagenham. FCC Waste, a contractor engaged by the London Borough of Barnet to manage refuse collection across the borough, is familiar with the Sulo iceberg system through its use across other London boroughs. Pre-occupation liaison between the applicant, LBB Waste Management and FCC Waste will be undertaken to confirm operational procedures and service arrangements prior to first occupation.

3.2 Technical Description

Each iceberg bin unit consists of a below-ground container (the 'iceberg') of 5,000 litres capacity, accessed via a kerbside inlet hopper at surface level. The above-ground element is compact, typically 800mm in height and designed to integrate discreetly into the streetscape. The container is emptied by a HIAB-equipped vehicle which lifts the bin using a hydraulic crane arm — a process which takes approximately 3–5 minutes per bin location and does not require the refuse vehicle to mount kerbs or access pedestrian areas.

Key technical parameters:

Parameter	Detail
Bin manufacturer	Sulo (or equivalent approved by LBB)
Container capacity	5,000 litres per bin
Surface footprint	Approximately 800mm above ground
Collection vehicle	HIAB-type lorry (hydraulic crane arm lift)
Number of residual waste bins	17 no.
Number of recycling bins	17 no.
Total bins on site	34 no. (plus supplementary central point)
Smart / connected functionality	Yes — fill level sensor alerts concierge when full
Security	Lockable inlet hopper to prevent misuse
Food waste	7L indoor food waste caddy per household. Communal food waste collected via: (a) dedicated food waste iceberg bin(s) on service road; or (b) LBB-supplied communal bins at the concierge refuse point — option to be agreed with LBB prior to first occupation. Food waste is not co-mingled with residual waste.

3.3 Site Distribution and Coverage

The iceberg bins will be positioned at regular intervals along the shared service route and at strategic nodes within the development; this layout has been designed to ensure that:

- Approximately 96% of homes are within 40 metres of a disposal point

- The remaining 4% of homes (approximately 19 units) are served by a central refuse point, located within easy reach of the concierge and managed as part of the regular emptying routine
- Bins are not visible from principal public streets, preserving the quality of the pedestrian environment
- Collection vehicles can access all bin locations from the shared service road without entering the pedestrianised street network
- The service road is secured by lockable retractable bollards (with fireman's key access) to restrict use to refuse collection vehicles, emergency services, and occasional resident removal vehicles

3.4 Rationale for Iceberg Bin System

The iceberg bin system has been selected in preference to a conventional bin store arrangement for the following reasons:

Benefit	Detail
Resident experience	Residents deposit waste via a surface-level inlet hopper — they never need to enter an enclosed, potentially unpleasant bin store space
Pest and vermin control	The underground sealed system eliminates the thermal and moisture conditions that attract vermin, which are commonly associated with traditional above-ground communal bin stores
Public realm quality	The compact surface footprint means the bins have negligible visual impact, preserving the character of the picturesque, pedestrianised streets
Operational efficiency	A single HIAB vehicle can serve all 34 bin locations in one continuous route along the service road, without requiring access to the pedestrianised street network or multiple vehicle manoeuvres around conventional bin store enclosures
Space efficiency	The space within buildings that would otherwise be dedicated to bin stores is freed up for high-quality cycle storage
Smart management	Integrated fill-level sensors allow the concierge to monitor bin capacity in real time and request collections only when needed, reducing unnecessary vehicle movements
Proven technology	The Sulo iceberg system is operational across other London boroughs including Barking and Dagenham. FCC Waste, Barnet's existing refuse contractor, is familiar with the system through its London-wide operations. Pre-occupation liaison with LBB and FCC will confirm service arrangements

3.5 Commercial and Amenity Uses

Waste from the commercial and amenity uses within the development (gym, café, co-working space, soft play, clubhouse) will be managed as follows:

- Commercial food waste from the café will be segregated into dedicated food waste containers and collected separately in accordance with Environment Act 2021 requirements and LBB guidance

- Dry recyclables from commercial uses will be segregated and deposited via the shared iceberg system, subject to agreement with LBB, or via a dedicated commercial recycling contract
- Bulky commercial waste will be managed via the concierge and disposed of through the building management's contracted waste service

4. Waste Segregation and Recycling

4.1 In-Dwelling Segregation

To facilitate high rates of waste segregation at source, kitchens within each dwelling will be designed to incorporate built-in segregated waste storage. Each kitchen will feature a minimum of three internal compartments:

1. Residual (non-recyclable) waste
2. Dry mixed recyclables (glass, cans, plastic, paper, card)
3. Food / kitchen organic waste (using the 7L indoor caddy provided)

This is consistent with the London Borough of Barnet's Waste and Recycling Strategy and with the GLA's guidance on household waste segregation. The built-in kitchen storage will be detailed within the interior design specification.

4.2 Communal Recycling

The iceberg bin system provides separate containers for residual waste and dry mixed recyclables, clearly identified by colour-coding and labelling in accordance with LBB and national recycling stream conventions. Food waste will be managed in accordance with LBB's adopted approach, which may involve separate dedicated food waste iceberg bins or collection by a designated food waste vehicle.

4.3 Resident Engagement and Education

The BTR management model provides an excellent opportunity to embed good waste behaviours from the outset. The following measures will be implemented:

- A Welcome Pack provided to all new residents will include clear and accessible guidance on the waste segregation system, bin locations, collection days, and what materials can be recycled
- Illustrated signage will be affixed to each bin inlet point, indicating which materials should be deposited
- The concierge team will be briefed to advise residents who are uncertain about the system
- Digital communications via the resident app (or equivalent BTR resident platform) will provide ongoing updates on collection schedules, recycling tips and any service changes
- Annual resident surveys will include questions on waste management satisfaction to inform ongoing improvement

4.4 Bulky Waste

Given the BTR tenure model, resident turnover will result in periodic bulky waste arisings (furniture, white goods, etc.). The following arrangements will apply:

- Residents wishing to dispose of bulky items will notify the concierge in advance
- The concierge will coordinate with LBB's bulky waste collection service (or a licenced waste contractor) to arrange removal
- The concierge will also facilitate reuse opportunities — for example by notifying residents of items available for collection by other residents, and by maintaining contact with local reuse organisations

5. Collection Operations

5.1 Collection Vehicle Access

The shared service road running along the periphery of the development has been designed to accommodate refuse collection vehicles. The road is:

- Accessible from The Fairway via the main site entrance (adjacent to the below-ground parking ramp)
- Supplemented by an emergency/service vehicle exit at the northern edge of the site
- Secured by lockable retractable bollards at each end, with fireman's key (or agreed equivalent) access for refuse vehicles and emergency services
- Designed as a shared surface, with vehicle speeds limited to ensure pedestrian safety

The HIAB refuse vehicle collecting the iceberg bins operates from the service road and does not need to enter the pedestrianised street network. The vehicle uses its hydraulic crane arm to lift bins from their positions adjacent to the road edge, minimising the time spent on site and the disruption to residents.

5.2 Collection Frequency

The indicative collection schedule is set out below. Final frequencies will be agreed with LBB Barnet Waste Management in advance of first occupation:

Waste Stream	Proposed Frequency	Collection Vehicle	Notes
Residual waste	Weekly	HIAB lorry	Smart sensors enable 'as required' scheduling
Dry mixed recycling	Weekly	HIAB lorry	Separate iceberg bins
Food waste (residential)	Weekly	LBB food waste vehicle or HIAB	LBB weekly food waste collection launches 30 March 2026. Final collection method (iceberg or communal bin at concierge point) to be confirmed with LBB prior to occupation
Commercial food waste (café)	As required	Specialist contractor	Subject to café operator agreement
Bulky waste	On request	LBB bulky waste vehicle	Pre-booked by concierge
WEEE	On request	WEEE contractor or LBB	Collection events / drop-off

5.3 Contingency Arrangements

The following contingency measures will apply to ensure continuity of waste management in the event of equipment failure, service disruption or exceptional demand:

- Sensor failure: if fill-level sensors malfunction, the concierge will revert to a scheduled collection programme (at minimum weekly for residual and recycling) until sensors are repaired. Sensor faults will be reported to the system supplier within 24 hours

- Blocked inlets or contaminated loads: the concierge will arrange prompt clearance of blocked inlet hoppers. Contaminated bins will be flagged to the contractor; temporary above-ground wheeled bins (supplied from a reserve held on site or by the management company) will be deployed adjacent to the affected location pending resolution
- HIAB vehicle breakdown or missed collections: if the collection vehicle is unable to attend on the scheduled day, the contractor will arrange an alternative collection within 48 hours. The concierge will notify residents and, if necessary, deploy temporary above-ground capacity to prevent overflow
- Seasonal or peak demand overflow (e.g. move-in/move-out periods): the concierge will monitor fill-level data and request additional collections in advance of known high-demand periods. The BTR management company will maintain a protocol for managing bulky waste and excess packaging at move-in events

5.4 Smart Bin Management

The Sulo iceberg bins will be equipped with fill-level sensors that transmit real-time data to the on-site concierge. This enables:

- Proactive collection requests to be made to FCC Waste when bins approach capacity, avoiding overflow
- Collection scheduling to be optimised, reducing unnecessary vehicle trips
- The concierge to identify patterns of high usage (e.g. at move-in/out periods) and pre-plan additional collections accordingly
- Performance data to be compiled to support annual reporting to LBB on waste diversion rates and recycling performance

6. Management Roles and Responsibilities

6.1 Overview

Stoney Wood Quarter will be operated by a professional Build to Rent management company. The management company will employ an on-site concierge team responsible for the day-to-day management of all communal services, including waste.

6.2 Roles and Responsibilities

Role	Party	Key Waste Management Responsibilities
BTR Management Company	Appointed by LBB	Overall responsibility for waste service performance; contract management with waste contractor; annual reporting; policy updates
On-Site Concierge	BTR Management Company staff	Day-to-day monitoring of bin fill levels; contacting contractor to arrange collections; supporting residents with queries; managing bulky waste bookings; maintaining communal bin areas
Waste Collection Contractor	LBB / FCC Waste (or appointed equivalent)	Emptying iceberg bins; food waste collection; bulky waste collection; provision of performance data
Residents	Individual tenants	Correct segregation of waste at source; use of designated inlet points; compliance with estate rules on waste disposal
Café / Commercial Operator	Commercial tenant(s)	Compliance with commercial waste segregation; contractor engagement for commercial food waste and cooking oil

6.3 Tenancy Agreement Obligations

The BTR tenancy agreement will include specific obligations relating to waste management. These will include:

- Using the designated waste inlet points and segregating waste correctly
- Not depositing waste outside of designated disposal points
- Not depositing hazardous, clinical or commercial quantities of waste in the communal bins
- Notifying the concierge for bulky waste or WEEE disposal
- Compliance with the estate's waste management policy, to be published on the resident portal

7. Circular Economy and Sustainability

7.1 Alignment with Circular Economy Principles

The waste management strategy for Stoney Wood Quarter has been developed in accordance with London Plan Policy SI7 and the GLA Circular Economy Guidance, supporting the transition to a more regenerative built environment. Key measures include:

- In-dwelling three-compartment segregation to maximise diversion of recyclable and food waste from landfill
- Smart bin technology enabling demand-led collection and minimising unnecessary vehicle movements
- A target of at least 95% diversion of operational waste from landfill through recycling, composting and energy recovery, of which a minimum of 50% through recycling and composting (i.e. excluding energy recovery)
- Bulky waste reuse facilitation through the concierge, encouraging residents to offer unwanted furniture and goods to others before disposal
- Annual waste data monitoring and reporting to track recycling rates and identify opportunities for improvement

7.2 Food Waste

In line with the Environment Act 2021 and LBB's evolving food waste collection service, the following measures will support high rates of food waste diversion:

- Each household will receive a 7-litre indoor food waste caddy as part of their welcome pack
- Compostable caddy liner bags will be provided or made available to purchase through the resident portal
- Two collection options will be agreed with LBB Barnet Waste Management prior to first occupation: (a) one or more dedicated food waste Sulo iceberg bins positioned on the service road, colour-coded and collected weekly by LBB's food waste vehicle; or (b) one or more communal LBB-supplied food waste bins (240L) located at the concierge-managed central refuse point, presented for weekly collection on the same day as other collections. The preferred option will be confirmed following pre-occupation discussions with LBB and FCC Waste
- Residents will empty their 7L indoor caddy into the communal food waste point (iceberg inlet or bin at concierge point). The concierge team will ensure the collection point is accessible, clean and clearly signposted at all times
- Food waste infrastructure will be confirmed on the site waste plan and reflected in updated drawings prior to submission of any pre-occupation compliance condition.

8. Monitoring, Review and Reporting

8.1 Performance Targets

The following performance targets will be adopted for the operational phase of the development:

Indicator	Target	Review Period
Diversion of waste from landfill	Minimum 95%	Annual
Dry recycling capture rate (residential)	Minimum 50% of total waste	Annual
Food waste capture rate (residential)	Minimum 30% of total organic waste	Annual (once LBB food waste service operational)
Bin overflow incidents	Zero reported incidents per quarter	Quarterly
Resident satisfaction with waste service	Minimum 80% satisfied	Annual (resident survey)
Concierge waste training completion	100% of concierge staff	On appointment and annually

8.2 Annual Review

The BTR Management Company will conduct an annual review of waste performance against the targets set out above. The review will consider:

- Waste tonnage data (residual, recycling, food waste) provided by the collection contractor
- Resident satisfaction survey results
- Any incidents of contamination, overflow, or misuse
- Updates to LBB waste policy or collection arrangements
- Any changes to the commercial tenancy waste arrangements

A summary report will be made available to LBB on request.

8.3 Adaptive Management

Where performance targets are not being met, the BTR Management Company will develop and implement an action plan in consultation with LBB. Actions may include additional resident communication campaigns, changes to collection frequency, or physical modifications to bin provision. Any material changes to the waste management strategy will be notified to LBB in writing.

9. Summary and Conclusions

This Operational Waste Management Plan demonstrates that the Stoney Wood Quarter development will be served by a robust, innovative and compliant waste management system throughout its operational life. The key conclusions are as follows:

1. The Sulo iceberg (underground) bin system has been selected as the primary waste storage solution. The system eliminates the need for above-ground bin stores, significantly improves resident experience, and is already proven within the London waste management landscape through its use by FCC Waste, Barnet's existing refuse contractor.
2. Waste storage capacity has been calculated on a per-dwelling litre-allocation basis; 17 x 5,000L iceberg bins for residual waste and 17 x 5,000L for recycling (34 total) will be provided, serving approximately 96% of homes within 40 metres. The remaining 4% (approximately 19 units) will be served by a central concierge-managed refuse point.
3. In-dwelling segregation will be facilitated by integrated three-compartment kitchen bins, encouraging separation of residual waste, dry recyclables and food waste at source.
4. The BTR operating model — with a professional on-site concierge, smart bin technology, and a management framework that embeds waste responsibilities in both the tenancy agreement and management protocols — provides an exceptionally strong platform for achieving high recycling rates.
5. The proposed system has been designed to comply with the intent of the London Borough of Barnet's Waste and Recycling Strategy, the London Plan (Policies SI7 and SI8), and the Mayor of London's GLA Circular Economy Guidance.
6. The collection vehicle access strategy ensures that refuse vehicles can service all bin locations from the peripheral service road without entering the pedestrianised streets, preserving the quality of the public realm and the safety of residents.

Appendix A: Relevant Policy Summary

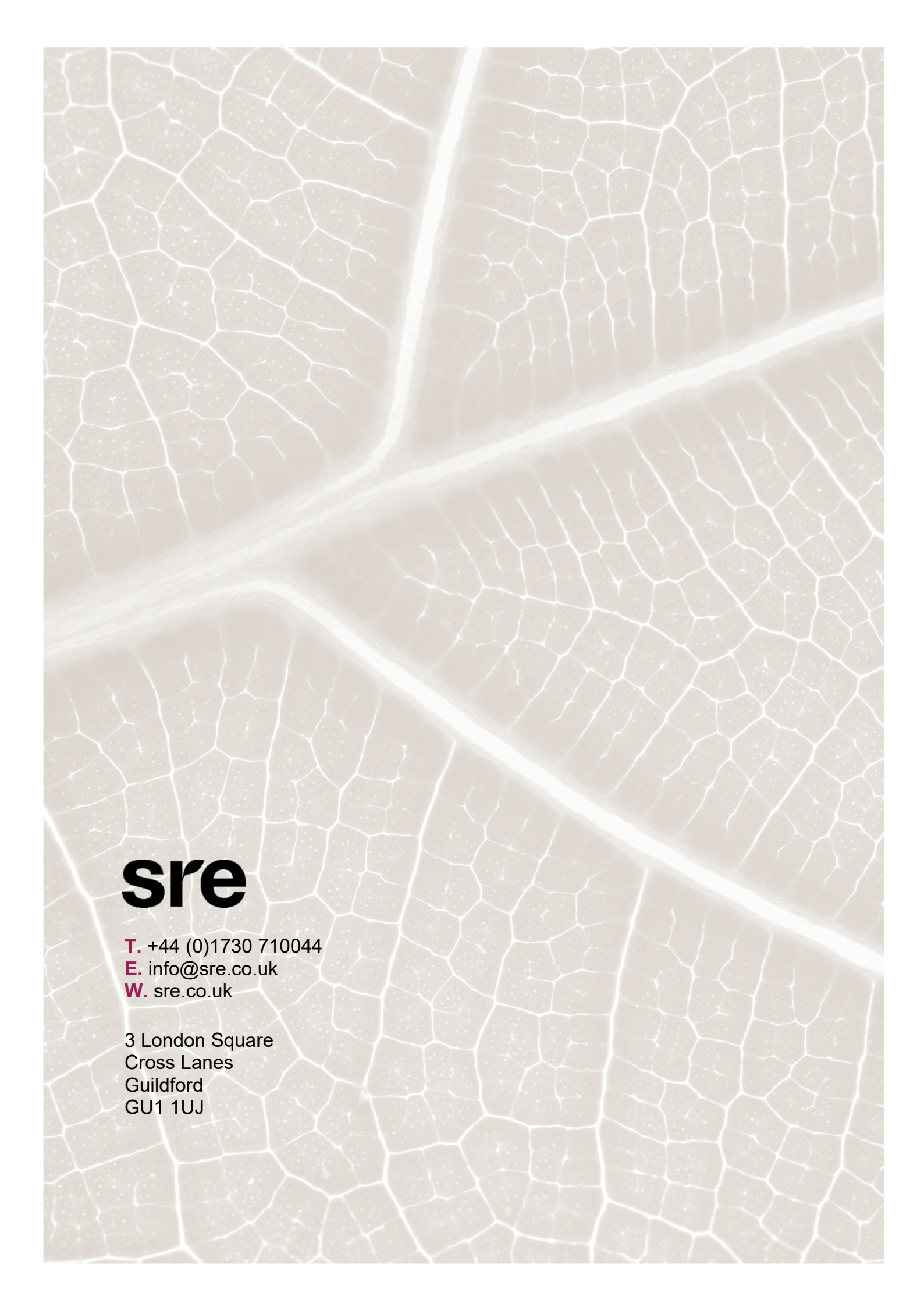
Policy / Document	Relevance
NPPF (2023)	Waste hierarchy; circular economy; sustainable development
Waste (England and Wales) Regulations 2011	Legal framework for waste hierarchy
Environment Act 2021	Mandatory food waste collection; consistent recycling streams
London Plan (2021) — SI7	Circular Economy compliance in development
London Plan (2021) — SI8	Waste self-sufficiency; encouraging sustainable waste management
London Plan (2021) — D3	Inclusive design of waste storage and access
GLA Circular Economy Guidance (2022)	Detailed guidance on circular economy requirements
Barnet Local Plan	Policy DM04: Environmental considerations including waste
Barnet Waste and Recycling Strategy	LBB-specific waste allocation and collection requirements
Barnet Sustainable Design and Construction SPD (2016)	Sustainability requirements including waste minimisation
BS8233:2014	Acoustic guidance informing servicing arrangements

Appendix B: Iceberg Bin System — Key Specifications

The following provides a summary specification for the Sulo underground iceberg bin system proposed. Final specification to be agreed with LBB Barnet Waste Management prior to installation.

Specification Item	Detail
Manufacturer	Sulo (or approved equivalent acceptable to LBB and FCC Waste)
System type	Semi-underground waste container with surface-level inlet hopper
Container volume	5,000 litres per unit
Above-ground height	Approximately 800mm
Collection method	HIAB lorry with hydraulic crane arm
Waste streams accommodated	Residual waste; dry mixed recyclables; food waste (subject to separate container or co-collection agreement)
Fill-level sensor	Integrated IoT sensor transmitting real-time fill data to concierge management system
Security	Lockable hinged inlet hopper with anti-vandal specification

Colour coding	To LBB / national recycling stream convention (grey/black = residual; blue = recycling; brown/green = food waste)
Precedent boroughs	London Borough of Barking and Dagenham (operational); further precedents available on request from Sulo
Current Barnet operator	FCC Waste (existing LBB waste contractor)



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15 RATHBONE PLACE
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13 May 2026

Dear Sirs,

RE: STONEY WOOD QUARTER – DAYLIGHT AND SUNLIGHT ADDENDUM

1. I write below with an addendum to the Daylight and Sunlight ES Chapter issued in October 2025, relating to the Proposed Development at Stoney Wood Quarter, Barnet. The commentary below follows comments from planning officers in relation to the daylight and sunlight impacts at 17-20 Fairway Court to the south-west of the Proposed Development.
2. As part of RIBA Stage 4 detailed design and taking into account the comments made in relation to Fairway Court, alterations have been made to Block A of the Proposed Development, the massing closest to the properties at 17-20 Fairway Court; these alterations include a refinement of the roof profile. The analysis of the potential daylight and sunlight impacts to these properties have therefore been updated as part of this addendum note based on scheme drawings received from London Placemaking in May 2026.
3. The analysis at 17-20 Fairway Court has been based on reasonably assumed layouts as plans showing the internal arrangements were not available on the local planning portal or local estate agent listings. It is considered likely that the small first floor windows serve bathrooms based on their size and external appearance. All other windows have been assumed to serve habitable space. The position of the entrance door in the side elevation has been used to guide the modelling of the room depths.
4. The results of the analysis for the revised massing are included in Appendix 1 of this addendum. They show improved results for the windows within 17-20 Fairway Court, as demonstrated in the table below.

Address	Window	Existing VSC	Previous Proposed VSC	Previous Ratio	Current Proposed VSC	Current Ratio
17-18 Fairway Court	W6/200 (GF)	16.24%	16.24%	1.00	16.24%	1.00
	W7/200 (GF)	18.58%	18.58%	1.00	18.58%	1.00
	W8/200 (GF)	16.78%	16.78%	1.00	16.78%	1.00
	W9/200 (GF)	13.59%	13.43%	0.99	13.44%	0.99
	W10/200 (GF)	27.70%	25.09%	0.91	24.68%	0.89
	W5/201 (1F)	25.75%	16.63%	0.65	16.68%	0.65
	W6/201 (1F)	23.47%	14.46%	0.62	14.48%	0.62

	W7/201 (1F)	23.55%	14.47%	0.61	14.49%	0.62
	W8/201 (1F)	14.97%	6.12%	0.41	6.17%	0.41
19-20 Fairway Court	W4/200 (GF)	29.58%	25.87%	0.87	26.03%	0.88
	W1/200 (GF)	31.06%	27.08%	0.87	27.31%	0.88
	W2/200 (GF)	29.45%	26.45%	0.90	26.71%	0.91
	W3/200 (GF)	29.77%	26.35%	0.89	26.56%	0.89
	W5/200 (GF)	27.62%	24.53%	0.89	24.60%	0.89
	W3/201 (1F)	23.52%	14.65%	0.62	14.82%	0.63
	W1/201 (1F)	15.00%	6.79%	0.45	6.98%	0.47
	W2/201 (1F)	23.72%	15.08%	0.64	15.26%	0.64
	W4/201 (1F)	25.34%	16.26%	0.64	16.35%	0.65

5. These results demonstrate that all ground floor windows continue to experience no worse than negligible changes in daylight with the Proposed Development in place following the minor alterations to Block A. Furthermore, all first-floor windows retain more daylight with the revised Proposed Development in place compared to the previous results.
6. The daylight & sunlight ES chapter included reference to the recommended BRE Guideline methodology relating to the impact of overhanging massing. Referring to balconies, the BRE Guidelines state in paragraph 2.2.13:

Because the balcony cuts out light from the top part of the sky, even a modest obstruction opposite may result in a large relative impact on the VSC, and on the area receiving direct skylight. One way to demonstrate this would be to carry out an additional calculation of the VSC and area receiving direct skylight, for both the existing and proposed situations, without the balcony in place.

7. In our view, it is appropriate to apply this methodology to the first floor windows at 17-20 Fairway Court given their significant overhanging eaves, as shown in the photo below, as these will have the same effect on daylight as an overhanging balcony.

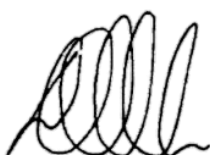


8. The results of this analysis are included in Appendix 2 of this addendum note and are summarised in the table below (first floor windows only)

Address	Window	Existing VSC with eaves off	Proposed VSC with eaves off	Current Ratio with eaves off
17-18 Fairway Court	W5/201	38.77%	29.70%	0.77
	W6/201	38.83%	29.83%	0.77
	W7/201	38.86%	29.80%	0.77
	W8/201	38.90%	30.09%	0.77
19-20 Fairway Court	W3/201	38.63%	29.93%	0.77
	W1/201	38.59%	30.53%	0.79
	W2/201	38.57%	30.11%	0.78
	W4/201	38.69%	29.71%	0.77

9. The results demonstrate that all first floor windows would retain in excess of 27% VSC (i.e. the target value in the BRE Guidelines at which point it is considered that a window is provided with sufficient daylight) with the Proposed Development in place were it not for the overhanging eaves which have a significant effect when the eaves are in situ. Furthermore, all windows are shown to experience no worse than minor adverse impacts to daylight in relative terms; the daylight impact to the property as a whole therefore remains as considered in the ES Chapter i.e. minor adverse and not significant.
10. As such, in our professional opinion, we do not perceive that the daylight and sunlight impact on Fairway Court can be considered an impediment to the development achieving planning.

Yours Sincerely,



Luke Wilson

Associate Director

For and on behalf of Point 2 Surveyors Ltd.

Appendix 1:

Daylight & Sunlight Results –
Fairway Court



DAYLIGHT & SUNLIGHT ANALYSIS

STONEY WOOD QUARTER, LONDON
EXISTING VS PROPOSED SCHEME 08/05/26

Receptor			Vertical Sky Component (VSC)			No-Sky Line (NSL)				Window Orientation		Annual Probable Sunlight Hours (APSH) (window)						Annual Probable Sunlight Hours (APSH) (room)					
Room	Room Use	Window	Existing VSC	Proposed VSC	%Loss	Room Area (sq ft)	Existing (sq ft)	Proposed (sq ft)	%Loss	Angle from South	Aspect	Existing		Proposed		Winter %Loss	Annual %Loss	Existing		Proposed		Winter %Loss	Annual %Loss
												Winter %	Annual %	Winter %	Annual %			Winter %	Annual %	Winter %	Annual %		

17-18 Fairway Court

R4/200	ASSUMED_RESI_HALF	W6/200	16.24	16.24	0.00	159.1	126.5	100.1	20.9	142°E	Northerly	0	11	0	11	-	0.0	0	11	0	11	-	0.0
R5/200	ASSUMED_RESI_HALF	W7/200	18.58	18.58	0.00	80.3	49.6	44.2	10.9	142°E	Northerly	1	14	1	14	0.0	0.0	1	14	1	14	0.0	0.0
R6/200	ASSUMED_RESI_HALF	W8/200	16.78	16.78	0.00	101.5	98.3	68.5	30.2	142°E	Northerly	1	12	1	12	0.0	0.0	2	15	2	15	0.0	0.0
R6/200	ASSUMED_RESI_HALF	W9/200	13.59	13.44	1.10					142°E	Northerly	1	9	1	9	0.0	0.0						
R6/200	ASSUMED_RESI_HALF	W10/200	27.70	24.68	10.90					142°E	Northerly	2	14	2	14	0.0	0.0						
R4/201	ASSUMED_RESI_HALF	W5/201	25.75	16.68	35.22	159.1	158.4	116.0	26.8	142°E	Northerly	2	12	2	10	0.0	16.7	2	12	2	10	0.0	16.7
R5/201	ASSUMED_RESI_HALF	W6/201	23.47	14.48	38.30	80.3	78.4	47.4	39.5	142°E	Northerly	1	10	1	7	0.0	30.0	1	10	1	7	0.0	30.0
R6/201	ASSUMED_RESI_HALF	W7/201	23.55	14.49	38.47	101.5	100.0	88.5	11.6	142°E	Northerly	1	10	1	7	0.0	30.0	1	10	1	7	0.0	30.0
R6/201	ASSUMED_RESI_HALF	W8/201	14.97	6.17	58.78					142°E	Northerly	0	5	0	2	-	60.0						

19-20 Fairway Court

R1/200	ASSUMED_RESI_HALF	W4/200	29.58	26.03	12.00	80.3	78.0	40.1	48.5	142°E	Northerly	2	18	2	19	0.0	-5.6	2	18	2	19	0.0	-5.6
R2/200	ASSUMED_RESI_HALF	W1/200	31.06	27.31	12.07	101.8	99.6	85.2	14.4	142°E	Northerly	2	22	2	22	0.0	0.0	2	22	2	22	0.0	0.0
R2/200	ASSUMED_RESI_HALF	W2/200	29.45	26.71	9.30					142°E	Northerly	2	21	2	22	0.0	-4.8						
R2/200	ASSUMED_RESI_HALF	W3/200	29.77	26.56	10.78					142°E	Northerly	2	21	2	22	0.0	-4.8						
R3/200	ASSUMED_RESI_HALF	W5/200	27.62	24.60	10.93	159.1	158.4	106.8	32.6	142°E	Northerly	2	18	2	18	0.0	0.0	2	18	2	18	0.0	0.0
R1/201	ASSUMED_RESI_HALF	W3/201	23.52	14.82	36.99	80.3	78.4	36.5	53.4	142°E	Northerly	1	11	1	10	0.0	9.1	1	11	1	10	0.0	9.1
R2/201	ASSUMED_RESI_HALF	W1/201	15.00	6.98	53.47	101.8	99.9	82.6	17.2	142°E	Northerly	2	9	2	8	0.0	11.1	2	12	2	11	0.0	8.3
R2/201	ASSUMED_RESI_HALF	W2/201	23.72	15.26	35.67					142°E	Northerly	2	12	2	11	0.0	8.3						
R3/201	ASSUMED_RESI_HALF	W4/201	25.34	16.35	35.48	159.1	158.4	117.0	26.2	142°E	Northerly	2	12	2	11	0.0	8.3	2	12	2	11	0.0	8.3

Appendix 2:

Daylight & Sunlight Results –
Fairway Court without eaves



DAYLIGHT & SUNLIGHT ANALYSIS

STONEY WOOD QUARTER, LONDON
EXISTING VS PROPOSED SCHEME 08/05/26

Receptor			Vertical Sky Component (VSC)			No-Sky Line (NSL)				Window Orientation		Annual Probable Sunlight Hours (APSH) (window)						Annual Probable Sunlight Hours (APSH) (room)					
Room	Room Use	Window	Existing VSC	Proposed VSC	%Loss	Room Area (sq ft)	Existing (sq ft)	Proposed (sq ft)	%Loss	Angle from South	Aspect	Existing		Proposed		Winter %Loss	Annual %Loss	Existing		Proposed		Winter %Loss	Annual %Loss
												Winter %	Annual %	Winter %	Annual %			Winter %	Annual %	Winter %	Annual %		

17-18 Fairway Court

R4/200	ASSUMED_RESI_HALF	W6/200	17.02	17.02	0.00	159.1	126.5	100.1	20.9	142°E	Northerly	0	14	0	14	-	0.0	0	14	0	14	-	0.0
R5/200	ASSUMED_RESI_HALF	W7/200	19.42	19.42	0.00	80.3	49.6	44.2	10.9	142°E	Northerly	1	17	1	17	0.0	0.0	1	17	1	17	0.0	0.0
R6/200	ASSUMED_RESI_HALF	W8/200	17.55	17.55	0.00	101.5	98.3	68.5	30.2	142°E	Northerly	1	15	1	15	0.0	0.0	2	18	2	18	0.0	0.0
R6/200	ASSUMED_RESI_HALF	W9/200	14.25	14.10	1.05					142°E	Northerly	1	12	1	12	0.0	0.0						
R6/200	ASSUMED_RESI_HALF	W10/200	28.37	25.35	10.65					142°E	Northerly	2	18	2	18	0.0	0.0						
R4/201	ASSUMED_RESI_HALF	W5/201	38.77	29.70	23.39	159.1	158.4	131.8	16.9	142°E	Northerly	2	23	2	21	0.0	8.7	2	23	2	21	0.0	8.7
R5/201	ASSUMED_RESI_HALF	W6/201	38.83	29.83	23.18	80.3	78.4	58.2	25.6	142°E	Northerly	2	23	2	20	0.0	13.0	2	23	2	20	0.0	13.0
R6/201	ASSUMED_RESI_HALF	W7/201	38.86	29.80	23.31	101.5	100.0	95.8	4.2	142°E	Northerly	3	24	3	21	0.0	12.5	3	24	3	21	0.0	12.5
R6/201	ASSUMED_RESI_HALF	W8/201	38.90	30.09	22.65					142°E	Northerly	3	24	3	21	0.0	12.5						

19-20 Fairway Court

R1/200	ASSUMED_RESI_HALF	W4/200	30.41	26.87	11.64	80.3	78.0	40.1	48.5	142°E	Northerly	2	21	2	22	0.0	-4.8	2	21	2	22	0.0	-4.8
R2/200	ASSUMED_RESI_HALF	W1/200	31.72	27.98	11.79	101.8	99.6	85.2	14.4	142°E	Northerly	2	22	2	22	0.0	0.0	2	22	2	22	0.0	0.0
R2/200	ASSUMED_RESI_HALF	W2/200	30.11	27.37	9.10					142°E	Northerly	2	21	2	22	0.0	-4.8						
R2/200	ASSUMED_RESI_HALF	W3/200	30.54	27.32	10.54					142°E	Northerly	2	21	2	22	0.0	-4.8						
R3/200	ASSUMED_RESI_HALF	W5/200	28.40	25.38	10.63	159.1	158.4	106.8	32.6	142°E	Northerly	2	21	2	21	0.0	0.0	2	21	2	21	0.0	0.0
R1/201	ASSUMED_RESI_HALF	W3/201	38.63	29.93	22.52	80.3	78.4	46.3	40.8	142°E	Northerly	2	23	2	22	0.0	4.3	2	23	2	22	0.0	4.3
R2/201	ASSUMED_RESI_HALF	W1/201	38.59	30.53	20.89	101.8	99.9	89.7	10.1	142°E	Northerly	2	23	2	22	0.0	4.3	2	23	2	22	0.0	4.3
R2/201	ASSUMED_RESI_HALF	W2/201	38.57	30.11	21.93					142°E	Northerly	2	23	2	22	0.0	4.3						
R3/201	ASSUMED_RESI_HALF	W4/201	38.69	29.71	23.21	159.1	158.4	130.3	17.8	142°E	Northerly	2	23	2	22	0.0	4.3	2	23	2	22	0.0	4.3

STONEY WOOD QUARTER

Ecology

Project	Stoney Wood Quarter
Site	Land at Stoney Wood Quarter, The Fairway, London NW7 3HJ
Purpose	Note responding to ecology and protected species matters (bats, badgers and reptiles)
Prepared by	London Placemaking in consultation with Phlorum
Date	July 2026

1. Introduction

This note has been prepared in response to the ecology and arboriculture feedback from the GLA on the Stoney Wood Quarter proposals (Ref. 25/2743/FUL). It sets out the ecological technical work and mitigation measures that are ongoing and proposed in respect of protected species, in particular bats, badgers and reptiles, together with the assessment of trees for potential bat roost features. Green infrastructure, BNG, UGF, arboricultural and CAVAT matters are addressed in the separate Green Infrastructure Note, to which this note should be read alongside.

2. Bat Roost Potential in Trees

Further assessment has been commissioned through Phlorum to examine trees T1 and T2, together with all other trees identified in the Preliminary Ecological Appraisal (PEA) within the small wooded area as having potential to support roosting bats. This has included the ivy-clad trees in the western woodland, where dense ivy can conceal cracks, cavities and splits that may constitute potential roost features. The ecologist has confirmed that all of the trees flagged in the PEA within the small wooded area, including trees T1 and T2, have been assessed.

The assessment has found no active bat roosts. Of the six Potential Roost Features (PRFs) recorded on the tree previously categorised as moderate (PRF-M), four have been downgraded to low (PRF-L) following inspection. An enquiry has been raised with the ecologist as to whether any further investigation of the remaining features is required. It is anticipated that planning conditions securing a dark corridor and sensitive working practices will mitigate any residual risk associated with the remaining PRF-M features.

The survey work is currently being concluded and Phlorum will provide a full report on completion. Should any feature be reassessed as having increased roost potential, or a roost be confirmed, further survey — aerial climbing inspection and/or dusk emergence and dawn re-entry surveys in the appropriate season — and, if necessary, a licence would be secured before any works affecting that feature proceed.

Possible outcome	Response
No Potential Roost Feature identified	No further bat survey or licence is likely to be required.
Potential Roost Feature identified, but no roost confirmed	Further survey, aerial inspection or precautionary working may be required, depending on the level of potential and proposed works.
Roost confirmed	Mitigation and any necessary licence will be secured before works affecting the roost proceed.

3. Badger Settle Closure and Artificial Settle Strategy

The development will require closure of the existing badger settle and creation of a replacement artificial settle outside the 30m disturbance zone. The replacement settle is proposed to be located on suitable land within the wider badger territory, with Mill Hill Golf Club land identified as the preferred location, subject to ecological confirmation, detailed design and Natural England licensing.

The strategy is based on ensuring that badgers are not excluded from the existing settle without suitable replacement provision. The artificial settle will therefore be created in advance of closure of the existing settle, outside the 30m disturbance zone, and in a location that maintains ecological connectivity to existing foraging routes and habitat.

3.1 Legal and licensing position

Badgers and their settles are protected by law. A licence is required where development would interfere with a settle, including by excluding badgers, damaging or destroying a settle, obstructing access, or disturbing badgers occupying a settle. The licensing strategy needs to demonstrate that avoidance has been considered and that settle closure is necessary, proportionate and supported by suitable mitigation.

For development-related settle closure, the relevant Natural England licence / approval or site registration route, as applicable, will be confirmed by the project ecologist (Phlorum). The programme will assume that the licence application will be supported by a clear method statement, plans, mitigation design, artificial settle design, evidence of the need for closure, timing controls and post-closure monitoring arrangements.

3.2 Core principles

The badger mitigation strategy will be based on the following principles:

- The existing settle will not be closed until a replacement artificial settle has been created outside the 30m disturbance zone
- The artificial settle will be located in an area suitable for long-term badger use taking into account all factors including flood risk
- The artificial settle will be created sufficiently in advance to allow badgers to locate and begin using it
- The existing settle will only be closed under licence and under the supervision of an appropriately qualified ecologist
- Closure will be undertaken during the appropriate licensed period - 1 July to 30 November, unless otherwise confirmed by Natural England
- The process will use exclusion rather than capture / translocation
- Post-closure monitoring will be undertaken to confirm that the existing settle has been successfully closed and that replacement provision remains available.

3.3 Artificial settle location

The artificial settle needs to be located outside the 30m zone of construction disturbance. Its location will be selected by the ecologist having regard to evidence of existing badger paths and territorial use, proximity to foraging habitat, connection to woodland, scrub and grassland, avoidance of future construction operations, avoidance of direct artificial lighting, avoidance of flood-prone or waterlogged ground, and the ability to secure long-term protection and management.

Mill Hill Golf Club land is highly suitable because it is close to the existing ecological network and provides an opportunity to locate the settle outside the development disturbance zone while remaining within the broader badger territory. The final location will need to be confirmed by the ecologist.

3.4 Artificial sett design

The artificial sett will be designed by the ecologist and constructed to replicate the functional characteristics of a natural sett. The detailed design will include multiple entrances, interconnecting tunnel sections, nesting chambers, free-draining construction, suitable soil cover, stable construction materials, natural spoil mounds around entrances, vegetative screening, entrance orientation away from disturbance, and connection to existing badger paths or newly created covered routes.

The artificial sett will not be located in an exposed or overly managed amenity area. It will be placed within or adjacent to cover so that badgers can approach it without crossing exposed, lit or heavily trafficked ground.

3.5 Timing of artificial sett creation

The artificial sett will be constructed in advance of closing the existing sett. As a minimum, the replacement sett must be in place before any exclusion work commences.

The recommended programme assumption should therefore be: artificial sett detailed design as soon as the final off-site location is confirmed; artificial sett construction in spring / early summer 2026, before any licensed exclusion works commence; badger acclimatisation / discovery period after construction and before exclusion; existing sett closure under licence once the required planning status and Natural England licence / approval or site registration, as applicable, is in place and within the 1 July to 30 November licensed period; and post-closure monitoring during enabling works and early construction.

3.6 Encouraging badgers to move

Badgers should not be captured and relocated as part of development mitigation. Instead, the strategy is to create a suitable replacement sett, encourage badgers to discover and use it, and then exclude the existing sett under licence once the replacement sett is available and the licensing requirements are met.

Measures to encourage discovery and use of the artificial sett may include locating the sett close to existing badger paths, creating covered access routes using scrub or hedgerow planting, using natural spoil and locally appropriate materials around entrances, ensuring the sett is dark, quiet and undisturbed, avoiding lighting, providing natural screening, using bedding material or dry vegetation where advised by the ecologist, and using short-term food trails only where ecologist-led and appropriate.

Any such measure should be carefully controlled by the ecologist to avoid creating dependency, nuisance or attraction to inappropriate areas.

3.7 Licence application and approval programme

The licence application will normally follow planning permission and be submitted once the required planning status is in place.

The licence application or site registration will be prepared in good time, with the programme allowing sufficient time for final mitigation design, preparation of plans and method statements, Natural England submission, determination, approval or site registration, as applicable, artificial sett construction, acclimatisation, licensed exclusion works, monitoring and closure.

3.8 Exclusion of the existing sett

Once the artificial sett has been created, badgers have had an opportunity to discover it, the licensed closure period has commenced, and Natural England licence / approval or site registration, as applicable, is in place, exclusion of the existing sett can proceed.

The typical process is for the ecologist to check the existing sett and confirm entrances, install one-way gates on active entrances, secure other entrances in accordance with the licence, allow badgers to leave the sett while preventing re-entry, monitor the sett for evidence of continued use, and then confirm when the sett is inactive. If badgers breach the exclusion measures, the exclusion period may need to restart.

3.9 Closure / destruction of the existing sett

The existing sett will only be closed or destroyed once the ecologist is satisfied, in accordance with the licence, that badgers have been excluded and the sett is no longer occupied. Closure needs to be undertaken under ecological supervision. Excavation will proceed carefully and progressively, opening tunnels and chambers in a controlled manner. If evidence of continued occupation is found, works will stop and the ecologist will determine the appropriate next step.

The closed sett area will then be made unsuitable for reoccupation, for example through backfilling, compaction or other measures agreed in the licence and method statement.

3.10 Post-closure monitoring

Post-closure monitoring will continue through enabling works and early construction. Monitoring will check that the existing sett has not been reopened, that badgers have not created a new sett within the construction zone, that the artificial sett remains available and undisturbed, that access routes remain open, that site fencing does not block badger movement, and that lighting does not affect the replacement sett or commuting routes.

The artificial sett and associated habitat will then be secured through the LEMP / HMMP or other management mechanism, with long-term access and protection agreed with the landowner.

3.11 Indicative badger mitigation programme

Stage	Indicative timing / requirement
Confirm artificial sett location outside 30m zone	As early as possible, with ecologist and landowner agreement.
Secure landowner agreement	Before licence submission and construction.
Detailed artificial sett design	Immediately after location is confirmed.
Construct artificial sett	Spring / early summer 2026 before any licensed exclusion works commence.
Allow discovery / acclimatisation period	After construction and before exclusion of the existing sett.
Prepare Natural England licence / site registration	In advance of the intended closure window.
Obtain Natural England licence / approval or site registration, as applicable	Before any interference with the existing sett.
Install one-way gates and exclude badgers	Normally within the 1 July to 30 November licensed period.
Monitor exclusion	As required by licence and ecologist.
Close / destroy existing sett	Only after the sett is confirmed inactive.
Post-closure monitoring	During enabling works and early construction.
Long-term protection of artificial sett	Through LEMP / HMMP and land agreement.

4. Reptile Surveys and Mitigation Strategy

Reptile surveys are being undertaken to determine presence and, if reptiles are found, to enable a population assessment to be made. The survey methodology includes the placement of refugia across suitable habitat, a bedding-in period before checks commence, and a series of survey visits on non-consecutive days during suitable weather conditions within the reptile active season.

The reptile survey is currently ongoing and has, to date, revealed the presence of reptiles on site. A planning condition will therefore be required to remove reptiles from the areas in which they are present prior to works commencing in those areas. A full report setting out the mitigation strategy will be provided once the on-site survey works have concluded, and the final mitigation approach will be confirmed at that stage.

The survey has been commissioned through Phlorum and the survey team is currently attending site, with survey work ongoing.

5. Summary of Commitments

1. Trees T1 and T2, and all other trees flagged in the PEA within the small wooded area, have been assessed for bat roost potential. The current findings are that no active roosts have been uncovered and that, of the six Potential Roost Features on the tree previously categorised as PRF-M, four have been downgraded to PRF-I. It is anticipated that planning conditions to create a dark corridor and to employ sensitive working practices will mitigate any residual risk from the remaining PRF-M features. The full report is to follow.
2. The existing badger sett will be closed under licence and replaced by a new artificial sett outside the 30m disturbance zone. The artificial sett will be created in advance of sett closure and located on suitable land within the wider badger territory, with Mill Hill Golf Club land identified as the preferred location.
3. The artificial sett will be constructed before the intended closure window in time to allow badgers to find and use it. Existing sett closure will be programmed within the normal licensed period, anticipated to be 1 July to 30 November unless otherwise confirmed by Natural England.
4. Reptile surveys are ongoing and have, to date, revealed the presence of reptiles. A planning condition will be required to remove reptiles prior to works commencing in the affected areas, with a full mitigation strategy to be provided once the survey works have concluded.

Overall, the approach is to continue reducing ecological and arboricultural impact where practicable, protect retained trees and woodland, provide robust protected species mitigation, and secure long-term management so that the ecological and landscape value of the scheme is maintained after occupation.

STONEY WOOD QUARTER

Green Infrastructure – UGF, BNG and Trees

Project	Stoney Wood Quarter
Site	Land at Stoney Wood Quarter, The Fairway, London NW7 3HJ
Purpose	Note responding to BNG, UGF, arboriculture (including CAVAT) and tree matters
Prepared by	London Placemaking in consultation with Quaife Woodlands and Tree Frontiers
Date	June 2026

1. Introduction

This note has been prepared in response to the ecology and arboriculture feedback from the GLA on the Stoney Wood Quarter proposals (Ref. 25/2743/FUL). It reviews how the scheme has evolved to improve its Biodiversity Net Gain (BNG), Urban Greening Factor (UGF) and tree retention performance, and sets out the arboricultural position, including retained and removed trees, CAVAT, construction-stage tree protection and long-term management. Ecology and protected species matters (bats, badgers and reptiles) are addressed in the separate Ecology Note, to which this note should be read alongside.

2. Design Development, BNG and UGF Enhancement

The scheme has undergone considerable design development, with biodiversity, urban greening, arboriculture, landscape quality and long-term management treated as core design considerations throughout. The layout was amended during the planning process to reduce ecological impact, retain more existing woodland and tree structure, and improve the quality and extent of the proposed green infrastructure.

The improvement is demonstrated by comparing the June 2025 and November 2025 BNG assessments. The June 2025 assessment, undertaken prior to the amendments to the layout, recorded a post-development area habitat position of 8.02 units, resulting in a net loss of -5.70 units, equivalent to -41.53%. It also recorded a loss of linear habitat units, with the post-development position falling from 0.44 units to 0.00 units.

Following design review, the scheme was amended to reduce the development footprint, retain more existing woodland and tree structure, and better integrate the northern watercourse and riparian edge into the ecological strategy. The November 2025 assessment recorded a materially improved BNG position. Area habitat loss was reduced from -41.53% to -16.12%, with the post-development area habitat score increasing from 8.02 units to 11.91 units. In unit terms, the residual area habitat deficit was reduced from -5.70 units to -2.29 units, an improvement of approximately 3.41 units, or around 60%. The linear habitat position was also improved, with post-development linear habitat increasing from 0.00 units to 0.78 units.

Watercourse habitats are now assessed separately. The November 2025 assessment records 9.83 watercourse units at baseline and no net change post-development, as the watercourses are retained. This is an important change from the earlier assessment because the northern watercourse and riparian corridor are now more clearly recognised within the ecological baseline and long-term management strategy.

The current BNG position does not remove the need for any residual off-site biodiversity provision. The November 2025 assessment continues to identify a residual deficit in area and linear habitat units. However, the comparison between the two assessments shows that the scheme no longer simply relies on off-site compensation. The design has first sought to avoid and reduce ecological loss through significant footprint reduction, increased tree and woodland retention, new native planting, green and brown roofs, watercourse assessment and long-term management commitments.

The current position is materially improved when compared with the earlier BNG assessment. The remaining biodiversity deficit is acknowledged and will be addressed through off-site biodiversity units / credits and secured long-term management. However, the scheme now demonstrates a stronger on-site ecological response and alignment with the mitigation hierarchy.

3. Options Explored to Enhance BNG and UGF

3.1 Reduced footprint and greater habitat retention

The most important ecological improvement during design development has been the increased retention of existing woodland and tree structure. This has allowed a greater proportion of existing ecological value to remain in situ, particularly at the northern and western edges of the site. This reduced the amount of compensatory provision required elsewhere and helped preserve immediate habitat value.

3.2 Retention of higher-value trees

The tree retention strategy focuses on retaining the principal tree groups and the higher-quality trees, particularly within the northern and western parts of the site. Retaining existing mature and semi-mature trees improves both Biodiversity Net Gain (BNG) and Urban Greening Factor (UGF). It also preserves canopy structure, supports habitat connectivity and maintains an established landscape setting from the outset of occupation.

The retention strategy is therefore more robust, with trees retained in meaningful groups and landscape areas rather than as isolated specimens. This reduces the risk that retained trees become vulnerable to construction impacts or future resident pressure after occupation.

3.3 New tree planting and canopy development

New tree planting is an important component of both the UGF strategy and the BNG strategy. It will reinforce the transition from the more urban southern edge of the site to the woodland character to the north and west. The detailed planting strategy will prioritise species that are climate-resilient, appropriate for the site conditions, beneficial to wildlife and suitable for long-term estate management.

Species selection will include a strong native and wildlife-beneficial component.

3.4 Green and brown roofs

Green and brown roofs will be developed as ecological infrastructure rather than simply as visual or drainage features. Their detailed specification will be agreed with the project ecologist and will include varied native wildflower and sedum mixes.

They will assist with UGF, SuDS performance, urban cooling, invertebrate habitat and foraging opportunities for birds and bats.

3.5 Native habitat replacement

The detailed landscape strategy will maximise the value of the significant landscaping that is proposed by using native, mixed-species planting rather than single-species ornamental landscaping. Suitable species will include hawthorn, blackthorn, hazel, field maple, dogwood, guelder rose, holly and native rose species, with a large number of trees introduced where spatially appropriate.

Planting will also be used to strengthen ecological connectivity across the site, particularly between retained woodland, the riparian corridor, new pocket landscapes and green roof habitats.

3.6 Woodland edge enhancement

The retained woodland edge will be enhanced through selective shrub planting, deadwood retention, log piles, hibernacula, invasive species control, woodland-edge ground flora, controlled access to prevent trampling, and sensitive lighting design to protect commuting and foraging habitats.

The objective will be to create a managed woodland edge that is ecologically functional, resilient and protected from gradual degradation after occupation. The woodland edge will not be treated as a narrow ornamental buffer; it will be managed as one of the principal ecological assets of the development.

3.7 Riparian buffer enhancement

The northern watercourse corridor will be protected and enhanced through sensitive planting, controlled access, avoidance of unnecessary lighting, and long-term management. Further enhancement will focus on strengthening native riparian planting, maintaining a naturalistic buffer, controlling erosion and trampling, retaining deadwood where safe, and ensuring no deterioration in watercourse condition.

Where public access is provided near the riparian zone, it will be carefully designed so that the watercourse edge is protected from littering, dog access, trampling and encroachment.

3.8 Species-specific enhancements

Species-specific measures will be secured through the detailed ecological enhancement strategy and LEMP / HMMP. These will include, where appropriate, bat boxes, bird boxes, bee bricks, invertebrate habitat, log piles, deadwood habitat, habitat piles, dark corridor protection and native berry and nectar planting.

3.9 Long-term management and monitoring

BNG and UGF performance will depend on long-term management, not only initial planting. The long-term management plan will therefore include clear habitat creation specifications, target condition criteria, establishment maintenance, replacement planting obligations, annual monitoring, adaptive management triggers, responsibility for funding and implementation, and reporting to the local planning authority where required.

4. Arboricultural Position

The scheme has been developed with a clear tree retention strategy in mind. The tree retention strategy focuses on retaining substantial groups rather than isolated remnants. This is important because tree retention is more meaningful if the retained trees can be protected during construction and managed successfully after occupation.

The current strategy retains all Category A trees and all but two of the Category B trees on site, in particular in the woodland group at the north-west of the site. This approach reduces both direct arboricultural impact and post-development pressure. The precise retained / removed position should be read with the Arboricultural Report and tree retention schedule.

Retained trees are being incorporated as part of the landscape structure of the development. They are not being treated as residual constraints or left-over features. The design intention is that retained trees contribute to shade, amenity, biodiversity, landscape maturity, wayfinding and the transition between the urban edge and woodland context.

The map below (and enclosed at Appendix 1) shows the trees that are being retained and removed with retained trees in black and removed in red:



Source: Quaife Woodlands Arboricultural Report

The following table lists all the trees on site and records which are retained and removed, showing that the most significant A and B trees are retained. With regard to the GLA's specific query in relation to trees T8 and T145, we can confirm that those trees are proposed to be removed as illustrated on the tree removal / retention plan and detailed below.

TREE	TRUNKØ (metres)	RPA	HEIGHT (metres)	SPREAD Ø (metre)	SPECIES	Category	Veteran/ Ancient	To be retained
1	0.16	1.92	6	3	Ash	C	N	N
2	0.14	1.68	6	4	Juneberry	C	N	N
3	0.54	6.48	8	8	Cherry	C	N	N
4	0.25	3.00	6	6	Apple	C	N	N
5	0.1	1.20	6	3	Oak	C	N	N
6	0.2	2.40	8	8	Ash	C	N	N
7	0.1	1.20	6	3	Willow	C	N	N
8	0.64	7.68	18	14	Oak	B	N	N
9	0.25	3.00	12	6	Ash	B	N	Y
10	1.02	12.24	18	16	Oak	A	N	Y
11	n/a	n/a	n/a	n/a	Birch- no longer present on site	n/a	n/a	n/a
12	n/a	n/a	n/a	n/a	Birch- no longer present on site	n/a	n/a	n/a
13	0.38	4.56	16	12	Birch	C	N	N
14	0.2	2.40	8	8	Ash	C	N	N
15	0.15	1.80	8	3	Wild Plum	C	N	N
16	0.3	3.60	18	12	Ash	B	N	Y
17	0.7	8.40	18	16	Oak	A	N	Y
18	0.43	5.16	18	16	Oak	B	N	Y
19	0.1	1.20	10	3	Oak	C	N	Y
20	0.2	2.40	12	4	Hawthorn	U	N	Y
21	0.1	1.20	12	3	Ash	C	N	Y
22	0.15	1.80	10	8	Cherry	C	N	Y
23	0.2	2.40	16	8	Ash	C	N	Y
24	0.2	2.40	16	6	Ash	C	N	Y
25	0.1	1.20	12	3	Ash	C	N	Y
26	0.4	4.80	16	12	Oak	B	N	Y
27	0.1	1.20	6	4	Holly	C	N	N
28	0.15	1.80	10	6	Sycamore	C	N	N
29	0.1	1.20	6	6	Ash	C	N	N
30	0.17	2.04	8	6	Ash	C	N	N
31	0.1	1.20	8	3	Ash	C	N	N
32	0.1	1.20	6	2	Holly	C	N	N
33	0.1	1.20	12	3	Ash	C	N	N
34	0.15	1.80	12	6	Ash	C	N	N
35	0.2	2.40	14	6	Ash	C	N	N
36	0.16	1.92	14	6	Ash	C	N	N
37	0.21	2.52	14	6	Ash	C	N	N
38	0.28	3.36	10	8	Hawthorn	C	N	Y
39	0.3	3.60	14	8	Bay Laurel	C	N	N
40	0.1	1.20	8	3	Hawthorn	C	N	N
41	0.2	2.40	10	8	Hawthorn	C	N	N
42	0.1	1.20	6	3	Hawthorn	C	N	N
43	0.44	5.28	12	8	Wild Apple	C	N	N
44	0.1	1.20	8	4	Ash	C	N	N
45	0.2	2.40	6	4	Oak	C	N	N
46	0.3	3.60	10	8	Wild Apple	C	N	N
47	0.19	2.28	12	8	Ash	C	N	N
48	0.22	2.64	6	3	Ash	C	N	N
49	0.3	3.60	16	12	Ash	C	N	N
50	0.14	1.68	12	6	Ash	C	N	N
51	0.3	3.60	18	10	Sycamore	C	N	Y
52	0.1	1.20	8	4	Beech	C	N	Y
53	0.1	1.20	8	6	Hawthorn	C	N	Y
54	0.19	2.28	16	8	Ash	C	N	Y
55	0.19	2.28	16	6	Ash	C	N	Y

56	0.13	1.56	14	4	Ash	C	N	Y
57	0.1	1.20	6	3	Yew	C	N	Y
58	0.1	1.20	16	6	Ash	C	N	Y
59	0.17	n/a	4	2	unknown	dead/dying	n/a	n/a
60	0.15	n/a	6	2	Cherry	dead/dying	n/a	n/a
61	0.15	n/a	4	1	Cherry	dead/dying	n/a	n/a
62	0.44	5.28	18	16	Oak	A	N	Y
63	0.05	0.60	6	4	Holly	C	N	Y
64	0.05	0.60	6	3	Holly	C	N	Y
65	0.1	1.20	8	2	Sycamore	C	N	Y
66	0.2	2.40	12	8	Hawthorn	C	N	Y
67	0.17	2.04	12	8	Hawthorn	C	N	Y
68	0.1	1.20	6	6	Hawthorn	C	N	Y
69	0.35	4.20	12	8	Hawthorn	C	N	Y
70	0.24	2.88	10	6	Hawthorn	C	N	Y
71	0.5	6.00	10	6	Birch	C	N	Y
72	0.1	1.20	12	3	Ash	C	N	Y
73	0.22	2.64	12	6	Ash	C	N	Y
74	0.42	5.04	18	14	Ash	A	N	Y
75	0.13	1.56	6	3	Hawthorn	C	N	Y
76	0.09	1.08	10	3	Ash	C	N	Y
77	0.11	1.32	12	3	Ash	C	N	Y
78	0.1	1.20	8	1	Ash	C	N	Y
79	0.18	2.16	10	3	Ash	C	N	Y
80	0.12	1.44	8	3	Ash	C	N	Y
81	0.1	1.20	12	2	Ash	C	N	Y
82	0.14	1.68	10	4	Ash	C	N	Y
83	0.12	1.44	10	4	Ash	C	N	Y
84	2x 0.2	4.80	6	4	Hawthorn	C	N	N
85	0.1	1.20	8	2	Ash	C	N	N
86	0.13	1.56	10	3	Ash	C	N	N
87	0.1	1.20	8	3	Ash	C	N	N
88	0.3	3.60	14	6	Field Maple	B	N	Y
89	0.2	2.40	14	6	Aspen	C	N	N
90	0.2	2.40	14	6	Ash	C	N	N
91	0.1	1.20	8	4	Aspen	C	N	N
92	0.1	1.20	10	2	Aspen	C	N	N
93	1	12.00	18	12	Poplar	C	N	N
94	0.15	n/a	10	10	Ash	dead/dying	n/a	n/a
95	0.2	n/a	12	4	Birch	dead/dying	n/a	n/a
96	0.15	n/a	10	3	Unknown	dead/dying	n/a	n/a
97	0.1	1.20	14	6	Willow	C	N	Y
98	0.2	2.40	16	6	Ash	C	N	Y
99	0.25	n/a	14	6	Unknown	dead/dying	n/a	n/a
100	0.5	6.00	18	10	Poplar	A	N	Y
101	0.3	3.60	16	8	Aspen	U	N	Y
102	0.4	n/a	14	8	Unknown	dead/dying	n/a	n/a
103	0.3	n/a	14	8	Unknown	dead/dying	n/a	n/a
104	0.3	n/a	16	6	Unknown	dead/dying	n/a	n/a
105	0.4	4.8	16	8	Aspen	U	N	Y
106	0.1	1.20	8	3	Aspen	U	N	Y
107	0.4	4.80	18	12	Aspen	U	N	Y
108	0.3	3.60	18	6	Aspen	U	N	Y
109	0.15	n/a	10	2	Unknown	dead/dying	n/a	n/a
110	0.2	2.40	8	6	Oak	C	N	Y

111	0.3	3.60	18	8	Aspen	U	N	Y
112	0.2	2.40	16	4	Aspen	U	N	Y
113	0.35	4.20	18	12	Aspen	C	N	Y
114	0.2	2.40	8	6	Oak	C	N	Y
115	0.3	3.60	18	10	Aspen	C	N	Y
116	0.4	4.80	18	16	Aspen	C	N	Y
117	0.3	n/a	16	10	Unknown	dead/dying	n/a	n/a
118	0.2	2.40	14	6	Aspen	C	N	Y
119	0.2	2.40	14	6	Aspen	C	N	Y
120	0.25	3.00	18	8	Aspen	C	N	Y
121	0.1	n/a	8	6	Unknown	dead/dying	n/a	n/a
122	0.3	3.60	16	10	Oak	C	N	Y
123	0.4	4.80	18	12	Aspen	B	N	Y
124	0.1	1.20	12	2	Oak	C	N	Y
125	0.4	4.80	20	12	Aspen	B	N	Y
126	0.18	2.16	12	6	Poplar	C	N	Y
127	0.13	1.56	6	4	Maple	C	N	Y
128	0.2	2.40	10	3	Sycamore	C	N	Y
129	0.2	2.40	12	6	Maple	C	N	N
130	0.3	3.60	18	6	Aspen	C	N	N
131	0.2	2.40	8	3	Aspen	C	N	N
132	0.15	1.80	14	4	Maple	C	N	N
133	0.1	1.20	8	3	Aspen	C	N	N
134	0.2	2.40	12	4	Maple	C	N	N
135	0.3	3.60	18	4	Aspen	C	N	N
136	0.2	2.40	14	6	Aspen	C	N	N
137	0.1	1.20	8	3	Aspen	C	N	N
138	0.1	1.20	6	3	Aspen	C	N	N
139	0.3	3.60	18	3	Aspen	C	N	N
140	0.4	4.80	18	8	Aspen	C	N	N
141	0.3	3.60	16	6	Aspen	C	N	N
142	0.25	3.00	14	6	Aspen	C	N	N
143	0.15	1.80	6	3	Hawthorn	U	N	N
144	0.15	1.80	10	3	Maple	C	N	N
145	0.3	3.60	16	10	Maple	B	N	N
146	0.2	2.40	14	8	Maple	C	N	N
147	0.3	3.60	14	8	Maple	C	N	N
148	0.29	3.48	10	6	Maple	U	N	N
149	0.3	n/a	18	10	Unknown	dead/dying	n/a	n/a
150	0.3	3.60	16	10	Maple	U	N	N
151	0.15	1.80	16	3	Aspen	C	N	N
152	0.15	1.80	12	4	Aspen	C	N	N
153	0.2	2.40	16	6	Aspen	C	N	N
154	0.15	1.80	16	6	Aspen	C	N	N
155	0.15	1.80	14	6	Aspen	C	N	N
156	0.15	1.80	12	6	Aspen	C	N	N
157	0.2	2.40	8	4	Aspen	C	N	N
158	0.15	1.80	8	6	Oak	C	N	N
159	n/a	n/a	n/a	n/a	no longer present on site	n/a	n/a	n/a
160					Ash	C	N	N
161					Ash	C	N	N
162					Ash	C	N	N
163	0.80	9.60	25	14	Oak	A	N	Y
164	Line x 3				Cypress	C	N	N
165	0.15	1.80			Cypress	C/B	N	N
166	Line x 3				Cypress	C/B	N	N
167	Line x 5				Birch	C	N	N
169	Line				not identified	C	N	N
					Existing trees		Retained trees	
					Total no Category A	6		6
					Total no Category B	9		7
					Total no Category C	125		50
					Total no Category U	11		8

5. CAVAT Assessment and Replacement Value

A Capital Asset Value for Amenity Trees (CAVAT) assessment of the trees affected by the proposed development has been undertaken by Tree Frontiers, chartered arboricultural consultants, and is enclosed in Appendix A. It has been prepared using the CAVAT Quick Method, which the CAVAT system expressly provides for the strategic valuation of larger tree populations rather than the detailed appraisal of a limited number of individual specimens. Given that the affected trees form part of a woodland block, woodland edge and grouped tree structure rather than being experienced as individual public-realm specimens, the Quick Method is the proportionate and technically appropriate methodology for this resource.

5.1 Trees removed and CAVAT value of loss

The scheme removes 79 trees or groups of trees and retains 71, including all Category A trees and all but two Category B trees, principally within the woodland group at the north-west of the site. The trees proposed for removal are predominantly internal Category C and Category U specimens with limited public accessibility or visibility. Applying a Community Tree Index (CTI) factor of 150% and a Unit Value Factor (UVF) of £23.56, the assessment concludes that the total CAVAT value of the trees proposed for removal is £263,262.

5.2 Replacement planting

The scheme provides 126 new trees, increasing the total tree stock on site from 150 to approximately 197 — a net increase of around 31%. The planting comprises a native, climate-resilient palette of twelve species distributed across the character areas of the scheme, from the welcome square and pocket parks through to the woodland-edge, meadow and riparian margins, reinforcing the transition from the more urban southern edge to the woodland character to the north and west.

5.3 CAVAT value of the replacement planting

The 126 replacement trees have been valued on the same basis as the trees removed, applying the CAVAT Quick Method with the same Unit Value Factor (£23.56) and Community Tree Index (150%). Consistent with the CAVAT methodology, newly planted trees carry a lower initial value than the established trees they replace, because they have not yet developed the trunk size, canopy, visibility and public benefit of mature stock. Applying a functional factor of 60% and a life-expectancy factor of 100% — the latter reflecting that the replacements are newly planted, healthy stock with the longest life expectancy — the replacement planting provides an on-site CAVAT value of £50,097.

For each tree the value is derived from its stem diameter (girth divided by π), converted to trunk basal area ($\pi/4 \times \text{diameter}^2$), multiplied by the UVF to give a base value, then by the CTI, and finally by the functional and life-expectancy factors. By way of worked example, a semi-mature small-leaved lime at 20/25 cm girth: $22.5 \div \pi = 7.16$ cm diameter $\rightarrow 40.3$ cm² basal area $\rightarrow \times £23.56 = £949$ base value $\rightarrow \times 1.5 = £1,424 \rightarrow \times 0.60 \times 1.0 = £854$.

Basis of the replacement valuation. The replacement valuation applies the same CAVAT Quick Method, and the same Unit Value Factor (£23.56) and Community Tree Index (150%), as the assessment of the trees removed, so that both the loss and the replacement provision are considered on a consistent, like-for-like basis. Because the replacement stock is of small stem diameter (approximately 4–9 cm, corresponding to the 12/14 to 25/30 cm girth nursery stock listed in the schedule), which falls at or below the smallest size band in the Quick Method look-up, the base value has been derived from a continuous Unit Value Factor $\times$ basal-area calculation; this reconciles with the Quick Method band values at each band's representative diameter.

5.4 Residual value and Section 106

The difference between the CAVAT value of the trees removed (£263,262) and the CAVAT value of the on-site replacement planting (£50,097) is a residual of £213,165. In accordance with Local Plan Policy CDH07 and London Plan Policy G7, where replacement trees of equal value cannot be provided on site, a contribution for the residual value may be made to provide trees within nearby streets and open spaces, secured through a Section 106 obligation.

5.5 Proportionate mitigation package

CAVAT is not intended to require direct financial equivalence between removed and replacement trees; it informs the planning balance by indicating the scale of public amenity value affected and the adequacy of the mitigation proposed. Taken as a whole, the arboricultural response is proportionate: the retention of all Category A and all but two Category B trees; a net increase in tree numbers from 150 to approximately 197; a fully-costed replacement planting programme (in the order of £167,000 to supply, plant and establish the 126 trees); a lifetime Tree Management Plan; and a residual CAVAT contribution secured by Section 106. Together these provide both immediate re-provision and a secured pathway to restoring public amenity value over the longer term.

5.6 Schedule of replacement trees

The schedule below lists each of the 126 replacement trees, with its species, nursery size, location within the scheme, CAVAT value and supply cost.

Ref	Species	Nursery size	Location in scheme	CAVAT value
N001	Small-leaved lime	Semi-mature 20/25 cm	Welcome square / primary frontage	£854
N002	Small-leaved lime	Semi-mature 20/25 cm	Welcome square / primary frontage	£854
N003	Small-leaved lime	Semi-mature 20/25 cm	Welcome square / primary frontage	£854
N004	Small-leaved lime	Semi-mature 20/25 cm	Welcome square / primary frontage	£854
N005	Silver birch	Semi-mature 20/25 cm	Welcome square / primary frontage	£854
N006	Silver birch	Semi-mature 20/25 cm	Welcome square / primary frontage	£854
N007	Silver birch	Semi-mature 20/25 cm	Welcome square / primary frontage	£854
N008	Silver birch	Semi-mature 20/25 cm	Welcome square / primary frontage	£854
N009	Hornbeam	Semi-mature 20/25 cm	Welcome square / primary frontage	£854
N010	Hornbeam	Semi-mature 20/25 cm	Welcome square / primary frontage	£854
N011	Beech	Semi-mature 25/30 cm	Welcome square / primary frontage	£1,055
N012	Beech	Semi-mature 25/30 cm	Welcome square / primary frontage	£1,055
N013	Crab apple	Heavy standard 12/14 cm	Play street	£285
N014	Crab apple	Heavy standard 12/14 cm	Play street	£285
N015	Crab apple	Heavy standard 12/14 cm	Play street	£285
N016	Crab apple	Heavy standard 12/14 cm	Play street	£285
N017	Crab apple	Heavy standard 12/14 cm	Play street	£285
N018	Crab apple	Heavy standard 12/14 cm	Play street	£285
N019	Crab apple	Heavy standard 12/14 cm	Play street	£285
N020	Crab apple	Heavy standard 12/14 cm	Play street	£285
N021	Crab apple	Heavy standard 12/14 cm	Play street	£285
N022	Crab apple	Heavy standard 12/14 cm	Play street	£285
N023	Crab apple	Heavy standard 12/14 cm	Play street	£285
N024	Crab apple	Heavy standard 12/14 cm	Play street	£285
N025	Crab apple	Heavy standard 12/14 cm	Play street	£285
N026	Crab apple	Heavy standard 12/14 cm	Play street	£285
N027	Wild pear	Heavy standard 12/14 cm	Play street	£285
N028	Wild pear	Heavy standard 12/14 cm	Play street	£285
N029	Wild pear	Heavy standard 12/14 cm	Play street	£285
N030	Wild pear	Heavy standard 12/14 cm	Play street	£285
N031	Wild pear	Heavy standard 12/14 cm	Play street	£285
N032	Wild pear	Heavy standard 12/14 cm	Play street	£285
N033	Wild pear	Heavy standard 12/14 cm	Play street	£285
N034	Wild pear	Heavy standard 12/14 cm	Play street	£285
N035	Wild pear	Heavy standard 12/14 cm	Play street	£285
N036	Wild pear	Heavy standard 12/14 cm	Play street	£285
N037	Wild pear	Heavy standard 12/14 cm	Play street	£285
N038	Wild pear	Heavy standard 12/14 cm	Play street	£285
N039	Wild pear	Heavy standard 12/14 cm	Play street	£285
N040	Wild cherry	Extra heavy 14/16 cm	Meadow / understorey	£380
N041	Wild cherry	Extra heavy 14/16 cm	Meadow / understorey	£380
N042	Wild cherry	Extra heavy 14/16 cm	Meadow / understorey	£380
N043	Wild cherry	Extra heavy 14/16 cm	Meadow / understorey	£380
N044	Wild cherry	Extra heavy 14/16 cm	Meadow / understorey	£380
N045	Wild cherry	Extra heavy 14/16 cm	Meadow / understorey	£380
N046	Wild cherry	Extra heavy 14/16 cm	Meadow / understorey	£380

Ref	Species	Nursery size	Location in scheme	CAVAT value
N047	Wild cherry	Extra heavy 14/16 cm	Meadow / understorey	£380
N048	Wild cherry	Extra heavy 14/16 cm	Meadow / understorey	£380
N049	Hornbeam	Extra heavy 14/16 cm	Woodland street & edge	£380
N050	Hornbeam	Extra heavy 14/16 cm	Woodland street & edge	£380
N051	Hornbeam	Extra heavy 14/16 cm	Woodland street & edge	£380
N052	Hornbeam	Extra heavy 14/16 cm	Woodland street & edge	£380
N053	Hornbeam	Extra heavy 14/16 cm	Woodland street & edge	£380
N054	Hornbeam	Extra heavy 14/16 cm	Woodland street & edge	£380
N055	Hornbeam	Extra heavy 14/16 cm	Woodland street & edge	£380
N056	Hornbeam	Extra heavy 14/16 cm	Woodland street & edge	£380
N057	Hornbeam	Extra heavy 14/16 cm	Woodland street & edge	£380
N058	Hornbeam	Extra heavy 14/16 cm	Woodland street & edge	£380
N059	Hornbeam	Extra heavy 14/16 cm	Woodland street & edge	£380
N060	Beech	Extra heavy 16/18 cm	Woodland street & edge	£488
N061	Beech	Extra heavy 16/18 cm	Woodland street & edge	£488
N062	Beech	Extra heavy 16/18 cm	Woodland street & edge	£488
N063	Holly	Rootball 1.5 m	Woodland street & edge	£285
N064	Holly	Rootball 1.5 m	Woodland street & edge	£285
N065	Holly	Rootball 1.5 m	Woodland street & edge	£285
N066	Holly	Rootball 1.5 m	Woodland street & edge	£285
N067	Yew	Rootball 1.5 m	Woodland street & edge	£285
N068	Yew	Rootball 1.5 m	Woodland street & edge	£285
N069	Black poplar	Extra heavy 14/16 cm	Wetland / riparian margin	£380
N070	Black poplar	Extra heavy 14/16 cm	Wetland / riparian margin	£380
N071	Black poplar	Extra heavy 14/16 cm	Wetland / riparian margin	£380
N072	Black poplar	Extra heavy 14/16 cm	Wetland / riparian margin	£380
N073	Black poplar	Extra heavy 14/16 cm	Wetland / riparian margin	£380
N074	Common alder	Extra heavy 14/16 cm	Wetland / riparian margin	£380
N075	Common alder	Extra heavy 14/16 cm	Wetland / riparian margin	£380
N076	Common alder	Extra heavy 14/16 cm	Wetland / riparian margin	£380
N077	Common alder	Extra heavy 14/16 cm	Wetland / riparian margin	£380
N078	Common alder	Extra heavy 14/16 cm	Wetland / riparian margin	£380
N079	Common alder	Extra heavy 14/16 cm	Wetland / riparian margin	£380
N080	Common alder	Extra heavy 14/16 cm	Wetland / riparian margin	£380
N081	Silver birch	Extra heavy 14/16 cm	Pocket park / open green	£380
N082	Silver birch	Extra heavy 14/16 cm	Pocket park / open green	£380
N083	Silver birch	Extra heavy 14/16 cm	Pocket park / open green	£380
N084	Silver birch	Extra heavy 14/16 cm	Pocket park / open green	£380
N085	Silver birch	Extra heavy 14/16 cm	Pocket park / open green	£380
N086	Silver birch	Extra heavy 14/16 cm	Pocket park / open green	£380
N087	Silver birch	Extra heavy 14/16 cm	Pocket park / open green	£380
N088	Silver birch	Extra heavy 14/16 cm	Pocket park / open green	£380
N089	Silver birch	Extra heavy 14/16 cm	Pocket park / open green	£380
N090	Silver birch	Extra heavy 14/16 cm	Pocket park / open green	£380
N091	Silver birch	Extra heavy 14/16 cm	Pocket park / open green	£380
N092	Silver birch	Extra heavy 14/16 cm	Pocket park / open green	£380
N093	Silver birch	Extra heavy 14/16 cm	Pocket park / open green	£380
N094	Silver birch	Extra heavy 14/16 cm	Pocket park / open green	£380
N095	Silver birch	Extra heavy 14/16 cm	Pocket park / open green	£380
N096	Silver birch	Heavy standard 12/14 cm	Pocket park / open green	£285
N097	Silver birch	Heavy standard 12/14 cm	Pocket park / open green	£285
N098	Silver birch	Heavy standard 12/14 cm	Pocket park / open green	£285
N099	Silver birch	Heavy standard 12/14 cm	Pocket park / open green	£285
N100	Silver birch	Heavy standard 12/14 cm	Pocket park / open green	£285
N101	Silver birch	Heavy standard 12/14 cm	Pocket park / open green	£285
N102	Silver birch	Heavy standard 12/14 cm	Pocket park / open green	£285
N103	Silver birch	Heavy standard 12/14 cm	Pocket park / open green	£285
N104	Silver birch	Heavy standard 12/14 cm	Pocket park / open green	£285
N105	Silver birch	Heavy standard 12/14 cm	Pocket park / open green	£285
N106	Silver birch	Heavy standard 12/14 cm	Pocket park / open green	£285
N107	Silver birch	Heavy standard 12/14 cm	Pocket park / open green	£285
N108	Small-leaved lime	Extra heavy 16/18 cm	Pocket park / open green	£488
N109	Small-leaved lime	Extra heavy 16/18 cm	Pocket park / open green	£488

Ref	Species	Nursery size	Location in scheme	CAVAT value
N110	Small-leaved lime	Extra heavy 16/18 cm	Pocket park / open green	£488
N111	Small-leaved lime	Extra heavy 16/18 cm	Pocket park / open green	£488
N112	Small-leaved lime	Extra heavy 16/18 cm	Pocket park / open green	£488
N113	Small-leaved lime	Extra heavy 16/18 cm	Pocket park / open green	£488
N114	Field maple	Heavy standard 12/14 cm	Boundary / defensible edge	£285
N115	Field maple	Heavy standard 12/14 cm	Boundary / defensible edge	£285
N116	Field maple	Heavy standard 12/14 cm	Boundary / defensible edge	£285
N117	Field maple	Heavy standard 12/14 cm	Boundary / defensible edge	£285
N118	Field maple	Heavy standard 12/14 cm	Boundary / defensible edge	£285
N119	Field maple	Heavy standard 12/14 cm	Boundary / defensible edge	£285
N120	Field maple	Extra heavy 14/16 cm	Boundary / defensible edge	£380
N121	Field maple	Extra heavy 14/16 cm	Boundary / defensible edge	£380
N122	Field maple	Extra heavy 14/16 cm	Boundary / defensible edge	£380
N123	Field maple	Extra heavy 14/16 cm	Boundary / defensible edge	£380
N124	Field maple	Extra heavy 14/16 cm	Boundary / defensible edge	£380
N125	Field maple	Extra heavy 14/16 cm	Boundary / defensible edge	£380
N126	Field maple	Extra heavy 14/16 cm	Boundary / defensible edge	£380
TOTAL — 126 trees				£50,097

CAVAT values are calculated on the CAVAT Quick Method (UVF £23.56, CTI 150%, functional factor 60%, life-expectancy factor 100%), consistent with the enclosed Tree Frontiers assessment of the trees removed. Nursery sizes are quoted as girth; CAVAT values are calculated on stem diameter ($\text{girth} \div \pi$).

6. Construction-Stage Tree Protection

Retained trees will be protected through a BS5837-compliant tree protection strategy secured through the Arboricultural Method Statement, Tree Protection Plan and Construction Environmental Management Plan. Tree protection measures will be installed before enabling works, demolition, vegetation clearance, site set-up or construction activity begins as illustrated below:



6.1 Pre-commencement controls

Before works begin, the project arboriculturist will brief the site manager and contractor with retained trees clearly identified and tree protection fencing installed in accordance with the approved Tree Protection Plan. Construction exclusion zones will be clearly signed, ground protection installed before access is required, and photographic evidence of installed protection recorded.

6.2 Tree protection fencing

In accordance with the Arboricultural Report, prepared by Quaife Woodlands, the tree protection fencing needs to be robust, immovable and suitable for the duration of the works. It prevents access into Root Protection Areas and retained woodland areas. The fencing will remain in place until all construction works, including external works, fitting out, landscaping and demobilisation, have been completed in the relevant area.

The fencing should not be moved, realigned or temporarily opened without arboricultural approval. Any unauthorised fencing movement should be treated as a compliance issue and recorded immediately.

6.3 Ground protection

Where access, working space or temporary routes are unavoidable near retained trees, ground protection will be installed before use. Ground protection will be installed in accordance with the tree protection strategy to prevent soil compaction, rutting and root damage.

No storage of materials, spoil, welfare units, fuels, chemicals, cement, washout water or waste will be permitted within Root Protection Areas.

6.4 Excavation near trees

Any excavation within or close to Root Protection Areas will be agreed with the project arboriculturist. Roots encountered during works should not be cut without arboricultural approval. If roots are unexpectedly encountered, works should pause and the project arboriculturist should inspect before works continue.

6.5 Services and drainage

Services will be routed outside Root Protection Areas wherever practicable. Drainage runs, lighting ducts, utilities, irrigation, CCTV, foundations for furniture and signage will all be coordinated with the tree protection strategy.

The layout of compounds, haul routes, storage areas, temporary works, drainage and services will be coordinated around the approved Tree Protection Plan and will not be allowed to compromise retained trees or woodland edge areas.

6.6 Site monitoring

A formal arboricultural monitoring regime will be secured by condition. This should include inspection after tree protection fencing is installed, regular inspections during enabling and construction works, inspections before and after any approved works within Root Protection Areas, photographic records, a clear process for reporting breaches, and corrective action if fencing is moved, roots are exposed or soil compaction occurs.

Monitoring should continue until the risk to retained trees has passed.

7. Post-Development Pressure on Retained Trees

The design has sought to reduce post-development pressure by retaining trees in meaningful landscape groups, woodland edge areas and open spaces rather than leaving them as isolated trees in constrained private areas. This means retained trees are more likely to be experienced as part of the character and amenity of the development.

7.1 Relationship between retained trees and new homes

The retained tree groups should be managed as positive landscape assets. The western retained trees will form part of the woodland-edge and open-space experience, providing shade, ecological value, seasonal interest and a mature landscape setting. The northern trees will help maintain the wooded character of the site edge and support ecological connectivity.

The estate management strategy will make clear that retained trees are part of the approved landscape and ecological infrastructure. They should not be treated as optional amenity features that can be removed or heavily reduced in response to resident preference.

The site has been designed to ensure there is sufficient buffer space between the retained trees and the homes so that the trees create a positive feature rather than an object residents resent.

7.2 Managing shading and nuisance pressure

Notwithstanding this, future resident expectations will need to be managed from the outset. The estate management plan will state that removal of retained trees will only be undertaken where justified by arboricultural safety, tree health, statutory requirements, approved ecological management, clearance required for access or buildings, or works approved by the local planning authority where required.

Routine seasonal issues such as leaf fall, shade, pollen, fruit fall, bird activity or general preference for more light will not justify removal.

The following wording should be incorporated into the estate management plan:

Retained trees and woodland edge habitats form an integral part of the approved landscape, arboricultural and ecological strategy for Stoney Wood Quarter. They will be managed by the estate management company in accordance with the approved Arboricultural Method Statement, LEMP / HMMP and long-term maintenance plan. Removal will only be considered where justified by arboricultural need, safety, statutory requirements, approved access clearances or ecological management objectives.

7.3 Protecting Root Protection Areas after occupation

Tree protection must not stop at practical completion. Post-occupation management needs to protect retained tree rooting environments by preventing vehicle access over Root Protection Areas, avoiding storage or maintenance compounds within Root Protection Areas, using permeable surfaces near trees, maintaining mulch or planted woodland-floor areas, preventing soil compaction, avoiding repeated event use or heavy footfall under tree canopies and ensuring replacement of failed understorey planting.

Where retained trees are adjacent to communal open space, the landscape design will use planting, edging, seating placement and path alignment to guide people away from sensitive root areas.

7.4 Woodland edge management

The retained woodland edge will be managed as a distinct landscape and ecological zone. This will include native shrub and understorey planting, thorny or dense planting where needed to discourage informal access, controlled access points, retention of deadwood where safe, log piles and habitat piles, invasive species monitoring, periodic arboricultural inspections, sensitive pruning only where justified, litter management, dark corridor protection and avoidance of garden-style over-management.

7.5 Lighting and tree pressure

Lighting can create post-development ecological pressure by affecting bats, birds and woodland-edge habitats. The lighting strategy will therefore be coordinated with the arboricultural and ecological strategy. Lighting needs to avoid direct illumination of retained tree canopies, woodland edge and bat corridors. It will use low-level directional fittings, minimise spill into the northern and western ecological edges, and be reviewed by the ecologist where it affects sensitive habitats.

7.6 Resident information and management culture

Residents need to be informed that the retained trees and woodland edge are part of the identity of the development. Welcome packs, estate rules or resident information boards can be used to explain why the trees are retained, why deadwood and log piles may be present, why some areas are not intended for access, why lighting is controlled, why pruning is limited, and how residents can report genuine safety concerns.

This will help reduce future pressure by establishing the retained woodland as a protected and valued asset.

8. Summary of Commitments

1. The scheme has been developed to improve BNG and UGF performance through reduced footprint, greater tree and woodland retention, new planting, riparian enhancement and species-specific ecological measures.
2. Further improvements will continue to be secured through detailed landscape design, ecological specification and long-term management.
3. The project team will continue to engage with the GLA on CAVAT and tree valuation
4. Retained trees will be protected during construction through tree protection fencing, construction exclusion zones, ground protection, arboricultural supervision and monitoring.
5. Post-development pressure will be managed through estate management controls, woodland edge management, Root Protection Area protection, resident information, lighting control and a clear policy that retained trees will not be removed in response to ordinary seasonal nuisance.

Overall, the approach is to continue reducing ecological and arboricultural impact where practicable, protect retained trees and woodland, provide robust protected species mitigation, and secure long-term management so that the ecological and landscape value of the scheme is maintained after occupation.

APPENDIX A – CAVAT ASSESSMENT

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Ref: 1417946-960-INF-LTR-FR-02

Alex Walker-Robson

London Placemaking

32 Tavistock Street

Covent Garden

WC2E 7PB

By Email: alex.walker-robson@londonplacemaking.com

8th July 2026

Dear Alex

Arboricultural Statement / Stoney Wood Quarter, Barnet

1. INTRODUCTION & SCOPE

- 1.1 You have instructed me to undertake a Capital Asset Value for Amenity Trees ([CAVAT](#)) valuation of trees associated with the proposed development scheme at the above site and to provide a supporting arboricultural statement.
- 1.2 You have advised that this is a live planning application (Barnet Council Ref: [25/2743/FUL](#)) that has been called in by the Greater London Authority (GLA) following refusal by Barnet Council in March 2026. Therefore, the scheme will be determined by the Mayor of London rather than the Local Planning Authority (LPA).
- 1.3 The scheme is for:

“Redevelopment of the site to provide new buildings up to six stories in height, comprising up to 463 residential units (Use Class C3), with ancillary flexible amenity and commercial facilities (Use Class E), along with hard and soft landscaping, new public squares and

playspace and associated residential amenity, car and cycle parking, waste and recycling storage, plant and other infrastructure. (This is an EIA application and is accompanied by an Environmental Statement)."

2. CAVEATS & LIMITATIONS

- 2.1 The CAVAT assessment has been undertaken using the 'Quick Method' defined in the CAVAT methodology. The rationale and scope of this is detailed in the following section.
- 2.2 The CAVAT assessment has been undertaken using the existing arboricultural information (Quaife Woodlands Ref: AR/4501c/jq). I have not undertaken a site visit to validate the existing data, however freely available online tools (Google Earth etc.) have been utilised as part of this assessment.
- 2.3 The CAVAT assessment has been based on the extent of trees identified for removal on the submitted Tree Retentions and Removals Plan (Ref: SWQ-LPM-A-00-DR-A-1020) (see Plate 1 below). Trees proposed for removal can be identified by red dashed outline.

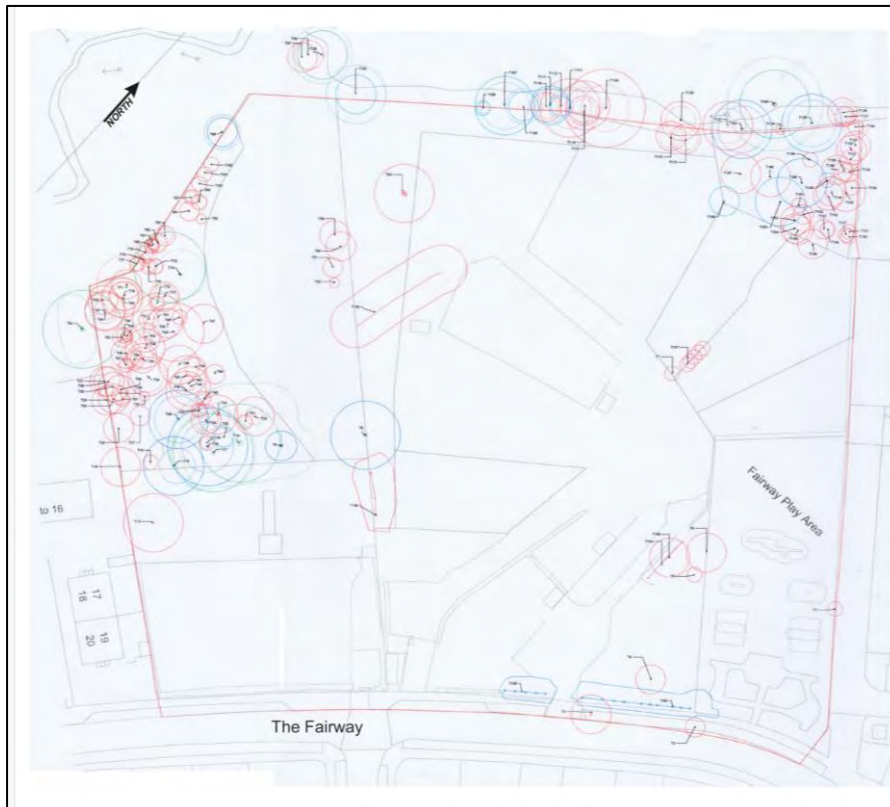


Plate 1 - Proposed Tree Retentions and Removals Plan (Source: Extract from Arboricultural Report (Ref: AR/4501c/jq))

- 2.4 This statement has been prepared with the assistance of AI tools to enhance the efficiency and accuracy of the data analysis and presentation. However, the content, conclusions, and recommendations contained herein are the original work of the author, Steve Westmore. The author has exercised professional judgment and expertise in the preparation of this statement, ensuring that all findings and opinions are independently derived and reflect the author's own analysis and interpretation.

3. PLANNING POLICY

- 3.1 In order to provide context to the planning submission and necessity for a CAVAT assessment it is important to understand the associated planning policy.

National Planning Policy

- 3.2 National Planning Policy is currently defined by the National Planning Policy Framework (NPPF). This provides the most current and up to date planning guidance.
- 3.3 At the heart of the NPPF is a presumption in favour of sustainable development, and specifically states that for decision making, the LPA should be approving development proposals that accord with the development plan without delay.
- 3.4 Section 12 of the NPPF recognises the importance of integrating trees into urban environments as part of achieving well-designed places. While the primary focus is on new tree planting, the importance of retaining existing trees and incorporation into proposals is a driving factor, stating that:

“Trees make an important contribution to the character and quality of urban environments, and can also help mitigate and adapt to climate change. Planning policies and decisions should ensure that new streets are tree-lined⁵³, that opportunities are taken to incorporate trees elsewhere in developments (such as parks and community orchards), that appropriate measures are in place to secure the long-term maintenance of newly-planted trees, and that existing trees are retained wherever possible. Applicants and local planning authorities should work with highways officers and tree officers to ensure that the right trees are planted in the right places, and solutions are found that are compatible with highways standards and the needs of different users.” (Paragraph 136)

Local Planning Policy

- 3.5 The LPA has a duty to ensure that local matters are considered through the planning process, and this includes protection of trees.
- 3.6 Barnet Council has prepared a specific development plan which includes trees and the natural environment. This plan is the Barnet Local Plan (2021-2036).
- 3.7 The policies within the Local Plan that are relevant to trees are summarised in Table 1.

Table 1: Summary of Local Planning Policy (Barnet Council)

Policy No	Title	Description (this is not a full copy of the policy. Only extracts relevant to trees are included below)
CDH07	Amenity Space and Landscaping	[text omitted] <i>e) Existing trees of value should be retained wherever possible. Retained trees must have their stems, canopy and root systems safeguarded. Where trees are removed they should be replaced with trees of equal value and of suitable sizes and species. In circumstances where it is demonstrated that it would not be possible to provide replacement trees on site to the value removed, a contribution to the Council for any residual value may be made to provide trees within nearby streets and open spaces. This may be secured using a planning obligation.</i>

- 3.8 In addition to the above, the LPA has developed a Supplementary Planning Document (SPD), this is the Planning Obligations Supplementary Planning Document (SPD) (2025). Section 7 of this document is 'Trees and Biodiversity'. The pertinent part of this is detailed in Table 2 below.

Table 2 - Barnet SPD (Replication of Table 7 contained within SPD)

Use	Scale/Impact	Location	Section 106 Requirements	Relevant Local Plan Policies
All	1. Developments which will result in the loss of one or more trees. 2. Developments that cannot achieve the relevant Urban Greening Factor score. 3. Where sufficient mitigation planting cannot be provided on site.	Boroughwide	Trees and Urban Greening Factor (UGF) 1. Where trees are removed, replacement trees of equal value and of suitable sizes and species. In circumstances where it is demonstrated that it would not be possible to provide replacement trees on site to the value removed, a contribution to the Council for any residual value may be made to provide trees within nearby streets and open spaces. This may be secured using a planning obligation. 2. When trees are removed the asset is degraded and the compensation required in terms of substitute planting to replace services lost should be based on a recognised tree valuation method such as Capital Asset Value for Amenity Trees (CAVAT). CAVAT contributions for loss of trees should be in accordance with London Plan Policy G7. This will be calculated by the Councils Arboriculturist. This may be secured using a planning obligation within a Section 106 Agreement. 3. Ensuring developers shall take a holistic approach to delivering BNG and Urban Greening Factor within the scheme to maximise opportunities to enhance the multiple benefits these requirements deliver for communities and nature. All developments shall comply with the Urban Greening Factor target scores set out in London Plan Policy G5. Developers should refer to the Greater London Authority's most up to date London Nature Recovery Strategy (LNRS), and London Green Infrastructure Framework (LGIF). 4. Where the Urban Greening Factor (UGF), as specified within Policy G5 of the London Plan, has not been met, additional trees will be required on site to enable development to achieve the UGF. All trees delivered within the curtilage of the development must be managed by the applicant for the lifetime of the development, with applications being accompanied by a Tree Management Plan. Where the above is not possible, a financial contribution covering the equivalent off-site provision will be expected. The biodiversity value of the trees lost shall be determined by the statutory DEFRA metric, which quantifies the ecological loss of each tree. This will be used to compare the reprovion of trees to an equal or greater ecological value. This will also determine the number of trees required to make up for the deficit in the Urban Greening Factor score. Biodiversity will be worked out and delivered through the Ecological Management Plan (EMP), or Biodiversity Net Gain Plan.	CDH07 Amenity Space and Landscaping Policy ECC05 (Barnet's Parks and Open Spaces)

- 3.9 As the scheme has been called in by the Greater London Authority, the relevant planning policy for this has also been included in Table 3. The London Plan sets out the overall vision for London as a whole and should be the basis for all local plans made by Local Planning Authorities. The London Plan was adopted in 2021.

Table 3: Summary of Local Planning Policy (GLA)

Policy No	Title	Description (this is not a full copy of the policy. Only extracts relevant to trees are included below)
G7	Trees and Woodlands	A. <i>London's urban forest and woodlands should be protected and maintained, and new trees and woodlands should be planted in appropriate locations in order to increase the extent of London's urban forest & the area of London under the canopy of trees.</i> B. <i>In their Development Plans, boroughs should:</i> 1) <i>Protect 'veteran' trees and ancient woodland where these are not already part of a protected site</i> 2) <i>Identify opportunities for tree planting in strategic locations</i> C. <i>Development proposals should ensure that, wherever possible, existing trees of value are retained. If planning permission is granted that necessitates the removal of trees there should be adequate replacement based on the existing value of the benefits of the trees removed, determined by, for example, i-tree or CAVAT or another appropriate valuation system. The planting of additional trees should generally be included in new developments – particularly large-canopied species which provide a wider range of benefits because of the larger surface area of their canopy.</i>

4. CAVAT ASSESSMENT & RATIONALE

- 4.1 The site contains 145 individual trees together with several tree groups, of which 79 individual trees and a number of tree groups are proposed for removal whilst all Category A trees and all but two Category B trees are retained.
- 4.2 Many trees proposed for removal are located internally to the site, with a small number of trees adjacent the boundary. Most of these consist of Category C trees.
- 4.3 A CAVAT assessment using the 'Quick Method' has been undertaken and is enclosed with this statement.
- 4.4 The CTI Factor has been automatically calculated at 150% and the Unit Value Factor (UVF) is £23.56.
- 4.5 The assessment concludes that the estimated total value of trees proposed for removal is £263,262.

Quick Method Rationale

- 4.6 In respect of which is the appropriate CAVAT method for the assessment, the following aspects need to be considered:
1. Purpose of the CAVAT Assessment
 2. Suitability of the 'Quick Method'

3. Scale and Complexity of the Tree Stock
4. Retention Quality
5. Proportionality within the Planning Process

Purpose of the CAVAT Assessment

- 4.7 The purpose of the CAVAT assessment is to provide an objective indication of the public amenity value of trees affected by the proposed development. The valuation is intended to inform the planning balance by assisting decision-makers in understanding the scale of tree-related impact arising from the proposal.
- 4.8 Its purpose is not to establish compensation or determine a financial transaction value, but rather to quantify the contribution that trees make to the public realm so that the significance of any losses can be properly understood and weighed in the planning balance.
- 4.9 In essence, CAVAT is a decision-support tool that helps planning authorities understand whether the public amenity value affected by a proposal is relatively limited, moderate or substantial, thereby informing judgements on the acceptability of development and the adequacy of mitigation and replacement planting proposals.
- 4.10 Importantly, CAVAT is not intended to require direct financial equivalence between removed and replacement trees. Newly planted trees will invariably have a much lower initial CAVAT value than established mature trees because they have not yet developed the size, visibility, ecosystem services and public benefit of the trees they replace.
- 4.11 Instead, CAVAT provides evidence to demonstrate:
 - Whether the proposed replacement planting is proportionate to the amenity value being lost.
 - Whether the development secures a reasonable pathway towards restoring public amenity value over the longer term.
 - Whether additional planting, landscape improvements or off-site contributions may be justified where the loss of public amenity is particularly significant.

Suitability of the 'Quick Method'

- 4.12 The CAVAT system expressly provides for both a Full Method and a Quick Method, recognising that different levels of assessment are appropriate in different circumstances. The Quick Method was developed specifically to facilitate the valuation of large tree populations where the purpose is strategic assessment rather than the detailed appraisal of a limited number of individual trees.
- 4.13 In the present case, the site contains 145 individual trees together with several tree groups, requiring a broad assessment of the overall amenity resource rather than a detailed forensic valuation of individual specimens. The Quick Method is therefore the methodology most closely aligned with the purpose and scale of the exercise.
- 4.14 The use of the Full Method would be misguided, misleading and disproportionate to the overall nature of the site.

Scale and Complexity of the Tree Stock

- 4.15 The proposal concerns a substantial tree population, of which 79 trees or groups of trees are proposed for removal, whilst 71 trees are retained. The assessment therefore concerns the valuation of a large and varied tree stock across the site rather than a small number of notable individual specimens.
- 4.16 In such circumstances, the Full Method would introduce a level of detail that is disproportionate to the purpose of the assessment. Whilst it may generate more precise values for individual trees, it would be unlikely to alter the overall conclusions regarding the scale of arboricultural effects arising from the development. The Quick Method provides a robust assessment of the collective amenity value affected by the proposals whilst remaining proportionate to the scale of the site.

Retention Quality

- 4.17 A key consideration is that the development has been designed to retain the most significant arboricultural features within the site. The submitted arboricultural report confirms that all Category A trees and all but two Category B trees are retained within the design scheme.
- 4.18 Accordingly, the trees proposed for removal are predominantly Category C and Category U specimens. Furthermore, nearly all of these trees are located internally to the site, with limited public accessibility or visibility, and therefore do not provide meaningful contribution to the immediate site or wider community.
- 4.19 Whilst the trees proposed for removal still contribute to the overall tree stock associated with the site, they do not represent the highest-value arboricultural assets. The principal public amenity resource is therefore retained, reducing the likelihood that the additional accuracy afforded by the Full Method would materially influence the assessment outcome or associated planning conclusions.

Proportionality within the Planning Process

- 4.20 Planning decisions should be informed by evidence that is proportionate to the nature, scale and complexity of the proposal. The objective is not to achieve absolute valuation precision but to provide sufficient information to understand the likely significance of the impacts and to reach a reasoned planning judgement.
- 4.21 Given the scale of the site and extent of the tree stock, the retention of the highest-category specimens and the strategic purpose of the exercise, the CAVAT Quick Method provides a level of accuracy that is entirely proportionate with the requirements of the planning process.

5. ADDITIONAL INFORMATION

- 5.1 In addition to the above, it is important to understand the extent and cost of replacement planting associated with the development scheme.
- 5.2 A total of 79 trees or groups of trees are proposed for removal. The scheme will result in replacement planting of 126 trees (see Plate 2 below). These include (but are not limited to) the following:

- Wild cherry
- Crab apple
- Pear
- Small-leaved lime
- Yew
- Alder
- Beech
- Silver birch
- Black poplar
- Field maple
- Hornbeam
- Holly

5.3 The estimated cost of replacement planting is £50,097.

5.4 This should be balanced against the CAVAT value of £263,262 for the associated tree removals.



Plate 2 - Proposed Replacement Planting (Source: SWQ-LPM-A-00-DR-A-1042)

6. CONCLUSION

- 6.1 In accordance with my instruction, I have provided a CAVAT assessment for the development scheme at Stoney Wood Quarter. I have also included a supporting statement.
- 6.2 The design scheme will result in the removal of 79 trees or groups of trees. The estimated value of tree loss is £263,262.
- 6.3 The estimated value of replacement trees is £50,097.
- 6.4 The CAVAT Quick Method represents the most appropriate and proportionate methodology for this development. It aligns with the purpose of the assessment, reflects the scale of the tree population under consideration and provides a sufficiently reliable indication of public amenity value to inform the planning balance. The use of the Full Method would be misguided given the context of the site and would be disproportionate to the nature of the exercise.

I trust that the above is as anticipated but any specific queries please give me a call.

Yours sincerely



Stephen Westmore MSc BSc Hons MArborA MICFor

Director and Chartered Arboriculturist

Enc: 1417946-960-INF-CAVAT-FR-01 CAVAT

7. ABOUT THE AUTHOR

- 7.1 I am a director of Tree Frontiers Ltd and a chartered arboricultural consultant, with a Master's degree in urban forestry and arboriculture from Myerscough College, accredited by the University of Lancaster.
- 7.2 I have 13 years' experience working in the sector and am a chartered member of the Institute of Chartered Foresters. I am also a professional member of the Arboricultural Association and abide by the code of ethics and professional standards of these institutions.
- 7.3 I am the sole author of this report, and all findings and recommendations presented are the result of my own independent observations and professional judgement, providing an impartial assessment of the trees and recommendations.

8. REFERENCES

- 8.1 This statement has relied upon the following external reference sources:
- British Standards Institution (2012) BS5837: *Trees in relation to design, demolition and construction – recommendations*. London: BSI
 - Gov.uk (2024) [National Planning Policy Framework](#). (Accessed 06.07.26)
 - Greater London Authority (2021) [The London Plan](#) (Accessed 06.07.26)
 - Barnet Council (2021) [Local Plan](#) (Accessed 06.07.26)
 - Barnet Council (2025) [25/2743/FUL](#) (Accessed 06.07.26)
 - CAVAT Group (2024) [CAVAT Full Method](#) (Accessed 06.07.26)

CAVAT Quick Method Project Sheet

Spreadsheet to calculate the asset value of tree stock using the Quick method

NOTES

Enter data and comments in grey boxes.

Data in white boxes are calculated automatically.

Project: Stoney Wood Quarter, Barnet

CTI Factor (Please select): 150%

Name of Surveyor: Steve Westmore

Unit Value Factor: £23.56

Date: 06/07/2026

Cumulative Total: £ 263,262

Tree Information			Step 1: Base Value		Step 2: CTI		Step 3: Functional factor		Step 4: Life expectancy	CAVAT VALUE
Tree No.	Species	Note on Location	Stem Diameter (1) (cm)	BASE VALUE	Autofills from CTI cell above	CTI Value	Please select	FUNCTIONAL VALUE	Please select	
T1	Ash	Boundary tree	12 - <15	£3,411.25	150%	£5,117	50	£ 2,558	10 - <20 years	£1,407
T2	Juneberry	Boundary tree	12 - <15	£3,411.25	150%	£5,117	50	£ 2,558	10 - <20 years	£1,407
T3	Cherry	Boundary tree	40 - <50	£37,923.83	150%	£56,886	50	£ 28,443	10 - <20 years	£15,644
T4	Apple	Internal tree	20 - <25	£9,478.66	150%	£14,218	50	£ 7,109	10 - <20 years	£3,910
T5	Oak	Internal tree	9 - <12	£2,079.41	150%	£3,119	50	£ 1,560	10 - <20 years	£858
T6	Ash	Internal tree	9 - <12	£2,079.41	150%	£3,119	50	£ 1,560	10 - <20 years	£858
T7	Willow	Internal tree	9 - <12	£2,079.41	150%	£3,119	50	£ 1,560	10 - <20 years	£858
T8	Oak	Internal tree	60 - <70	£78,628.91	150%	£117,943	50	£ 58,972	10 - <20 years	£32,434
T13	Birch	Boundary tree	30 - <40	£23,122.49	150%	£34,684	50	£ 17,342	10 - <20 years	£9,538
T14	Ash	Boundary tree	15 - <20	£5,778.80	150%	£8,668	50	£ 4,334	10 - <20 years	£2,384
T15	Wild Plum	Internal tree	12 - <15	£3,411.25	150%	£5,117	50	£ 2,558	10 - <20 years	£1,407
T27	Holly	Internal tree	9 - <12	£2,079.41	150%	£3,119	50	£ 1,560	10 - <20 years	£858
T28	Sycamore	Boundary tree	12 - <15	£3,411.25	150%	£5,117	50	£ 2,558	10 - <20 years	£1,407
T29	Ash	Boundary tree	9 - <12	£2,079.41	150%	£3,119	50	£ 1,560	10 - <20 years	£858
T30	Ash	Boundary tree	15 - <20	£5,778.80	150%	£8,668	50	£ 4,334	10 - <20 years	£2,384
T31	Ash	Internal tree	9 - <12	£2,079.41	150%	£3,119	50	£ 1,560	10 - <20 years	£858
T32	Holly	Internal tree	9 - <12	£2,079.41	150%	£3,119	50	£ 1,560	10 - <20 years	£858
T33	Ash	Internal tree	9 - <12	£2,079.41	150%	£3,119	50	£ 1,560	10 - <20 years	£858
T34	Ash	Internal tree	12 - <15	£3,411.25	150%	£5,117	50	£ 2,558	10 - <20 years	£1,407
T35	Ash	Boundary tree	15 - <20	£5,778.80	150%	£8,668	50	£ 4,334	10 - <20 years	£2,384
T36	Ash	Boundary tree	15 - <20	£5,778.80	150%	£8,668	50	£ 4,334	10 - <20 years	£2,384
T37	Ash	Boundary tree	20 - <25	£9,478.66	150%	£14,218	50	£ 7,109	10 - <20 years	£3,910
T39	Bay Laurel	Internal tree	25 - <30	£14,103.72	150%	£21,156	50	£ 10,578	10 - <20 years	£5,818
T40	Hawthorn	Internal tree	9 - <12	£2,079.41	150%	£3,119	50	£ 1,560	10 - <20 years	£858
T41	Hawthorn	Internal tree	15 - <20	£5,778.80	150%	£8,668	50	£ 4,334	10 - <20 years	£2,384
T42	Hawthorn	Internal tree	9 - <12	£2,079.41	150%	£3,119	50	£ 1,560	10 - <20 years	£858
T43	Wild Apple	Internal tree	40 - <50	£37,923.83	150%	£56,886	50	£ 28,443	10 - <20 years	£15,644
T44	Ash	Internal tree	9 - <12	£2,079.41	150%	£3,119	50	£ 1,560	10 - <20 years	£858
T45	Oak	Internal tree	15 - <20	£5,778.80	150%	£8,668	50	£ 4,334	10 - <20 years	£2,384
T46	Wild Apple	Internal tree	25 - <30	£14,103.72	150%	£21,156	50	£ 10,578	10 - <20 years	£5,818
T47	Ash	Internal tree	15 - <20	£5,778.80	150%	£8,668	50	£ 4,334	10 - <20 years	£2,384
T48	Ash	Internal tree	20 - <25	£9,478.66	150%	£14,218	50	£ 7,109	10 - <20 years	£3,910
T49	Ash	Internal tree	25 - <30	£14,103.72	150%	£21,156	50	£ 10,578	10 - <20 years	£5,818
T50	Ash	Internal tree	12 - <15	£3,411.25	150%	£5,117	50	£ 2,558	10 - <20 years	£1,407
T84	Hawthorn	Internal tree	15 - <20	£5,778.80	150%	£8,668	50	£ 4,334	10 - <20 years	£2,384
T85	Ash	Internal tree	9 - <12	£2,079.41	150%	£3,119	50	£ 1,560	10 - <20 years	£858
T86	Ash	Internal tree	12 - <15	£3,411.25	150%	£5,117	50	£ 2,558	10 - <20 years	£1,407

T87	Ash	Internal tree	9 - <12	£2,079.41	150%	£3,119	50	£ 1,560	10 - <20 years	£858
T89	Aspen	Internal tree	15 - <20	£5,778.80	150%	£8,668	50	£ 4,334	10 - <20 years	£2,384
T90	Ash	Internal tree	15 - <20	£5,778.80	150%	£8,668	50	£ 4,334	10 - <20 years	£2,384
T91	Aspen	Internal tree	9 - <12	£2,079.41	150%	£3,119	50	£ 1,560	10 - <20 years	£858
T92	Aspen	Internal tree	9 - <12	£2,079.41	150%	£3,119	50	£ 1,560	10 - <20 years	£858
T93	Poplar	Internal tree	9 - <12	£2,079.41	150%	£3,119	50	£ 1,560	10 - <20 years	£858
T129	Maple	Internal tree	15 - <20	£5,778.80	150%	£8,668	50	£ 4,334	10 - <20 years	£2,384
T130	Aspen	Internal tree	25 - <30	£14,103.72	150%	£21,156	50	£ 10,578	10 - <20 years	£5,818
T131	Aspen	Internal tree	15 - <20	£5,778.80	150%	£8,668	50	£ 4,334	10 - <20 years	£2,384
T132	Maple	Internal tree	12 - <15	£3,411.25	150%	£5,117	50	£ 2,558	10 - <20 years	£1,407
T133	Aspen	Internal tree	9 - <12	£2,079.41	150%	£3,119	50	£ 1,560	10 - <20 years	£858
T134	Maple	Internal tree	15 - <20	£5,778.80	150%	£8,668	50	£ 4,334	10 - <20 years	£2,384
T135	Aspen	Internal tree	25 - <30	£14,103.72	150%	£21,156	50	£ 10,578	10 - <20 years	£5,818
T136	Aspen	Internal tree	15 - <20	£5,778.80	150%	£8,668	50	£ 4,334	10 - <20 years	£2,384
T137	Aspen	Internal tree	9 - <12	£2,079.41	150%	£3,119	50	£ 1,560	10 - <20 years	£858
T138	Aspen	Internal tree	9 - <12	£2,079.41	150%	£3,119	50	£ 1,560	10 - <20 years	£858
T139	Aspen	Internal tree	25 - <30	£14,103.72	150%	£21,156	50	£ 10,578	10 - <20 years	£5,818
T140	Aspen	Internal tree	30 - <40	£23,122.49	150%	£34,684	50	£ 17,342	10 - <20 years	£9,538
T141	Aspen	Internal tree	25 - <30	£14,103.72	150%	£21,156	50	£ 10,578	10 - <20 years	£5,818
T142	Aspen	Internal tree	20 - <25	£9,478.66	150%	£14,218	50	£ 7,109	10 - <20 years	£3,910
T143	Hawthorn	Internal tree	12 - <15	£3,411.25	150%	£5,117	25	£ 1,279	5 - <10 years	£384
T144	Maple	Internal tree	12 - <15	£3,411.25	150%	£5,117	50	£ 2,558	10 - <20 years	£1,407
T145	Maple	Internal tree	25 - <30	£14,103.72	150%	£21,156	75	£ 15,867	20 - <40 years	£12,693
T146	Maple	Internal tree	15 - <20	£5,778.80	150%	£8,668	50	£ 4,334	10 - <20 years	£2,384
T147	Maple	Internal tree	25 - <30	£14,103.72	150%	£21,156	50	£ 10,578	10 - <20 years	£5,818
T148	Maple	Internal tree	25 - <30	£14,103.72	150%	£21,156	25	£ 5,289	5 - <10 years	£1,587
T150	Maple	Internal tree	25 - <30	£14,103.72	150%	£21,156	25	£ 5,289	5 - <10 years	£1,587
T151	Aspen	Internal tree	12 - <15	£3,411.25	150%	£5,117	50	£ 2,558	10 - <20 years	£1,407
T152	Aspen	Internal tree	12 - <15	£3,411.25	150%	£5,117	50	£ 2,558	10 - <20 years	£1,407
T153	Aspen	Internal tree	15 - <20	£5,778.80	150%	£8,668	50	£ 4,334	10 - <20 years	£2,384
T154	Aspen	Internal tree	12 - <15	£3,411.25	150%	£5,117	50	£ 2,558	10 - <20 years	£1,407
T155	Aspen	Internal tree	12 - <15	£3,411.25	150%	£5,117	50	£ 2,558	10 - <20 years	£1,407
T156	Aspen	Internal tree	12 - <15	£3,411.25	150%	£5,117	50	£ 2,558	10 - <20 years	£1,407
T157	Aspen	Internal tree	15 - <20	£5,778.80	150%	£8,668	50	£ 4,334	10 - <20 years	£2,384
T158	Oak	Internal tree	12 - <15	£3,411.25	150%	£5,117	50	£ 2,558	10 - <20 years	£1,407
T160	Ash	Internal tree	9 - <12	£2,079.41	150%	£3,119	50	£ 1,560	10 - <20 years	£858
T161	Ash	Internal tree	9 - <12	£2,079.41	150%	£3,119	50	£ 1,560	10 - <20 years	£858
T162	Ash	Internal tree	9 - <12	£2,079.41	150%	£3,119	50	£ 1,560	10 - <20 years	£858
G164	Cypress Group	Internal group	15 - <20	£5,778.80	150%	£8,668	50	£ 4,334	10 - <20 years	£2,384
G165	Cypress Group	Boundary group	15 - <20	£5,778.80	150%	£8,668	50	£ 4,334	10 - <20 years	£2,384
G166	Cypress Group	Internal group	25 - <30	£14,103.72	150%	£21,156	50	£ 10,578	10 - <20 years	£5,818
G167	Birch Group	Internal group	12 - <15	£3,411.25	150%	£5,117	50	£ 2,558	10 - <20 years	£1,407
G169	Unidentified line	Internal group	30 - <40	£23,122.49	150%	£34,684	50	£ 17,342	10 - <20 years	£9,538

TECHNICAL MEMORANDUM

Project: Stoney Wood Quarter, Mill Hill, London
Subject: Response to LBB Environmental Health and Planning Comments
To: Alex Kuropatwa
Written By: Jacob Tyler-White MIOA **Checked By:** Oliver Packman MIOA
Memo Ref.: 28113.TM.01 RevA **Date:** 15 May 2026

1.0 INTRODUCTION

KP Acoustics Ltd has been commissioned to provide formal technical clarification regarding the Noise Impact Assessment (NIA) report (Ref: 28113.NIA.01 Rev.E). This note specifically addresses feedback from the London Borough of Barnet (LBB) Environmental Health (EH) team and the Planning Officer regarding the suitability of the noise survey data.

The following sections provide a detailed response to the specific concerns raised by the local authority, incorporating direct quotes from their feedback to ensure all points are addressed comprehensively.

2.0 INTERNAL NOISE LEVEL CRITERIA

British Standard BS8233:2014 *Sound Insulation and Noise Reduction for Buildings* provides recommended internal ambient noise levels for residential dwellings. The recommended criteria are reproduced in Table 2.1 below.

Activity	Location	Maximum Noise Criteria	
		07:00 to 23:00	23:00 to 07:00
Resting	Living Rooms	35 dBA	-
Dining	Dining Room/area	40 dBA	-
Sleeping (daytime resting)	Bedrooms	35 dBA	30 dBA

Table 2.1 BS8233 recommended internal background noise levels

It should be noted that the above internal noise level criteria are not intended to apply during “purge ventilation” conditions, as defined within Approved Document F of the Building Regulations, since this mode of ventilation would only occur occasionally (for example, to remove excess heat, odours, or smoke from cooking). However, the recommended internal noise levels should be achieved under normal background ventilation conditions, whether through passive or mechanical means.

In addition, the WHO Guidelines for Community Noise (1999) recommend that individual night-time noise events within bedrooms should not regularly exceed 45 dB L_{Amax} more than 10 to 15 times per night.

Accordingly, the external building fabric, glazing systems and ventilation strategy have been designed to ensure compliance with the above guidance.

3.0 RESPONSE TO LBB ENVIRONMENTAL HEALTH AND PLANNING COMMENTS

The following comments were received from the London Borough of Barnet (LBB) Environmental Health team. Responses to each point are provided alongside the relevant comments below.

3.1 Duration of Measurements and Reliability of Dataset

Comment from LBB Environmental Health:

“Having reviewed the submitted documents, I am not satisfied with the noise survey data from Location-A (described as being at the nearest position to the M1) where only a single short term attended measurement was taken on 16/11/2024 between 11:45-12:00am (15 minutes duration).”

Response:

The attended measurement at Position A was intentionally limited to a short-term attended exercise as this location comprised an open and easily accessible area adjacent to the western boundary of the site. Unlike Positions 1 and 2, which were located within a secure compound suitable for unattended deployment, Position A was not considered appropriate for unattended long-term monitoring equipment due to security and access constraints.

However, Position A was not assessed in isolation. Continuous long-term unattended monitoring was also undertaken at Positions 1 and 2 between Thursday 12 December 2024 and Monday 16 December 2024, providing a robust dataset covering multiple days, weekday and weekend conditions and full diurnal cycles.

The unattended monitoring durations were as follows:

- Position 1: 92 hours
- Position 2: 91 hours 15 minutes.

Full time-history data showing maximum noise levels (L_{AFmax}), ambient noise levels ($L_{Aeq,T}$) and background noise levels (L_{AF90}) are enclosed within Appendix TH1 and TH2. The attended

measurement at Position A was undertaken during a representative daytime period under normal motorway operating conditions.

The purpose of the attended measurement at Position A was to establish the relative difference in noise level between the closest practical position to the M1 motorway and the long-term unattended monitoring locations, rather than to independently characterise temporal variation across the site.

The long-term unattended measurements allow the attended measurement at Position A to be calibrated against concurrent measurements at Position 1, enabling representative daytime and night-time noise levels to be derived over the full survey duration. This approach is consistent with the representative measurement principles contained within ISO 1996-2:2017, particularly in situations where site access or security constraints prevent unattended monitoring at the closest façade location.

Importantly, the dominant noise source affecting both Position 1 and Position A was steady-state motorway traffic associated with the M1. As the same dominant source governed the noise climate at both locations, the relative difference in measured noise level between the positions remained consistent. This therefore allowed representative façade noise exposure at Position A to be robustly derived from the long-term unattended monitoring data.

Accordingly, the assessment is not reliant upon a single 15-minute attended measurement in isolation, but instead utilises a combination of long-term unattended monitoring and a short-term attended measurement to derive representative worst-case façade noise levels across the site.

3.2 Position of Measurement Location A

Comment from LBB Environmental Health:

Firstly: the site measurement position for location A, shown in Figure 2.1 (page 2 of the Noise Impact Assessment (NIA) by 'KP Acoustics', dated 28/03/2025) is not near to the site boundary and not at the nearest position to the M1.

Comment from Planner:

The EH Team's first concern is that the noise measurement for Location A was taken from a point that is neither close to the site boundary nor the nearest part of the site to the M1. Although this position may give a general indication of noise levels in that part of the site, the EH Team advise that it is not suitable for assessing the constant traffic noise from the M1 that would affect Blocks A and B of the proposed development.

Response:

The following table and figure present the environmental noise survey measurement positions referred to throughout this technical memorandum.

Icon	Location Description
1	The microphone was installed on a tripod approximately 1.5m above ground level to the southwest of the site. The microphone was positioned in free-field conditions, approximately 1.5 metres from the nearest reflective surface.
2	The microphone was installed on a tripod approximately 1.5m above ground level to the east of the site. The microphone was positioned in free-field conditions, approximately 1.5 metres from the nearest reflective surface.
A	The microphone was installed on a tripod atop a mound to the northwest of the site, at the closest practical position to the M1. The microphone was positioned in free-field conditions, approximately 1.5 metres from the nearest reflective surface.

Table 3.1 Measurement positions and descriptions



Figure 3.1 Site measurement positions (Image Source: Google maps)

Position A was located approximately 120 metres from the M1 motorway, whilst the nearest proposed façades are located approximately 90 metres to 100 metres from the motorway.

The figure demonstrates that Position A was located along the north-western edge of the site boundary at the closest practical and accessible location to the M1 motorway within the application site.

The measurement position was selected to achieve suitable free-field measurement conditions in accordance with ISO 1996-2:2017, whilst also accounting for site access and security constraints associated with unattended monitoring equipment.

The relative difference in distance between Position A and the most onerous façades is limited (approximately 20-30 metres). Accordingly, standard distance corrections can be applied in order to derive representative worst-case façade noise levels (refer Section 3.3).

Furthermore, given that the dominant noise source across this part of the site is steady-state motorway traffic from the M1, the noise climate across the western boundary of the site is considered relatively spatially uniform.

3.3 Representativeness of the Measurement Data

Comment from LBB Environmental Health:

Whilst it may be argued that the measurement location will be representative of the noise level 'across' this area of the site, when considering the potential impact of steady-state noise from the M1 on blocks A & B of the proposed development, the potential impact is too significant to accept measurements taken at this location for such a short duration.

Secondly: the duration of the measurement at location A (one measurement of 15-minute duration) is woefully inadequate and will not be accepted as representative of the noise climate in this area of the site nearest to the M1 Motorway.

Comment from Planner:

The second concern is that the 15 minute noise measurement taken at Location A (as identified in the report) is far too short and cannot be treated as a reliable indication of noise levels in part of the site that is closest to the M1 motorway.

Response:

The measured survey results are summarised below. Table 3.2 presents the ambient noise levels measured over the full unattended survey duration at Positions 1 and 2.

Position	Survey Duration	Daytime $L_{Aeq,T}$	Night-time $L_{Aeq,T}$
1	12/12/2024 16:01 to 16/12/2024 12:01	60 dBA	57 dBA
2	12/12/2024 16:12 to 16/12/2024 11:27	56 dBA	51 dBA

Table 3.2 Long-term unattended monitoring results

The attended measurement undertaken at Position A was not intended to independently characterise temporal variation across the site. Instead, the purpose of the attended

measurement was to establish the relative difference in noise level between the closest practical position to the M1 motorway and the long-term unattended monitoring locations.

Table 3.3 below compares the attended measurement undertaken at Position A against the concurrent measurement recorded at Position 1 during the same representative daytime period.

Position	Measurement Period	Measured $L_{Aeq,T}$
1	16/12/2024 11:45 to 12:00	62
A	16/12/2024 11:45 to 12:00	64

Table 3.3 Comparison Between Position 1 and Position A

The attended measurement undertaken at Position A recorded a noise level 2 dB higher than Position 1 during the same measurement period. This differential was subsequently applied to the long-term unattended monitoring data at Position 1 in order to derive representative daytime and night-time noise levels at Position A, as follows:

- Daytime: $60 + (2) = 62$ dBA $L_{eq,T}$
- Night-time: $57 + (2) = 59$ dBA $L_{eq,T}$

The next step is to account for the reduced setback distance between Position A and the nearest worst-case affected façades.

Description	Derive Noise Level at Worst-Case Affected Façades	
	Façade at 100m from M1	Façade at 90m from M1
Derived noise level at Position A (Daytime / Night-time)	62 / 59 dBA	62 / 59 dBA
Correction for reduced setback distance to M1*	+0.8 dB	+1.2 dB
Derived worst-case façade level (Daytime / Night-time)	63 / 60 dBA	63 / 60 dBA

Table 3.4 Deriving worst case façade noise levels

* A line-source propagation correction of $10\log(r_1/r_2)$ has been applied to account for the reduced setback distance between Position A and the nearest proposed façades relative to the M1 motorway.

The calculations above demonstrate that, even when applying conservative corrections to derive worst-case façade exposure along the western boundary façades, the resultant façade noise levels are approximately 63 dBA daytime and 60 dBA night-time.

Furthermore, given that the dominant noise source across this part of the site is steady-state motorway traffic from the M1, the noise climate across the western boundary of the site is considered relatively spatially uniform.

These calibrated façade noise levels were subsequently used to derive the glazing and ventilation specifications for the development. Please note that the full octave-band calculations used to derive the required glazing and trickle ventilation specifications are enclosed within Appendix B(1-3).

The calculations demonstrate that the predicted internal noise levels at the worst-case affected façades (refer Appendix B(3) - Glazing Type 3) remain compliant with the BS8233:2014 recommended internal ambient noise criteria of:

- 35 dBA $L_{Aeq,T}$ during daytime periods within living rooms and bedrooms
- 30 dBA $L_{Aeq,T}$ during night-time periods within bedrooms.

The calculations also demonstrate compliance with the WHO Guidelines for Community Noise (1999), which recommend that individual night-time noise events should not regularly exceed 45 dBA L_{max} more than 10-15 times per night.

Accordingly, the assessment demonstrates that acceptable internal residential noise conditions can be achieved through the specified glazing and ventilation measures across the development, including the worst-case façades adjacent to the M1 motorway.

The required glazing and trickle ventilation specifications are summarised in the following table.

Glazing Configuration	Sound Reduction Indices (dB) at Octave Band Centre Frequency (Hz)						$R_w (C;C_{tr})$, dB	Trickle Vents dB $D_{n,e,w}$
	125	250	500	1k	2k	4k		
Glazing Type 1 (BLUE)	20	21	29	38	34	45	32 (-1;-4)	39
Glazing Type 2 (GREEN)	24	20	25	35	38	35	31 (-1;-4)	31
Glazing Type 3 (RED)	20	25	29	38	34	45	33 (-1;-4)	39

Table 3.5 Required glazing performance



Figure 3.2 Glazing layouts

3.4 Additional Measurements Requested by EH

Comment from LBB Environmental Health:

"We will require additional noise measurements to be taken at the boundary to the West of the site (and location-A). If only attended measurements can be provided (possibly for security reasons) we will require a number of measurements that are taken throughout the day and include both early morning and early evening rush-hour periods, with additional measurements take throughout the day overall."

Comment from Planner:

"As such, they have advised that additional noise measurements would need to be taken at the western site boundary (and Location A) and that if the method of recording can only be undertaken in person (as opposed to an unmanned survey) then several individual measurements would be required during the early morning and early evening rush hour periods, along with further measurements through the daytime, so that the typical noise conditions of the site can be captured."

Response:

The Environmental Health team have requested additional attended measurements at Position A in order to demonstrate that the short-term measurement is representative of noise conditions throughout the day, including peak traffic periods associated with the M1 motorway.

However, the assessment methodology already incorporates long-term unattended monitoring undertaken over periods exceeding 91 hours at Positions 1 and 2. These measurements captured weekday and weekend conditions, including daytime, evening, night-time and rush-hour traffic periods.

The attended measurement undertaken at Position A was not intended to represent the full temporal variation at the site in isolation. Instead, it was undertaken to establish the relative difference in noise level between the closest practical position to the M1 motorway and the long-term unattended monitoring locations.

By comparing the attended measurement at Position A against concurrent measurements at Position 1, it was possible to establish a representative correction factor between the locations. This correction factor was subsequently applied to the full long-term unattended dataset in order to derive representative daytime and night-time noise levels at Position A.

Accordingly, the long-term unattended measurements already capture the temporal variation requested by the Environmental Health team, including peak traffic periods and representative daily fluctuations associated with the M1 motorway.

Accordingly, the additional attended measurements requested would not materially alter the conclusions of the assessment, as the calibrated long-term unattended dataset already provides a representative and robust assessment of worst-case façade noise exposure across the development site.

3.5 Alleged Discrepancies Between Table 2.1 and Figure 2.1

Comment from Planner:

“Aside from concerns about the methodology, the EH Team have noted discrepancies within the report in respect of the measurement positions noted in Table 2.1 and Figure 2.1 on page two of the assessment. Along with addressing the above methodology concerns, they require that these discrepancies be corrected and clarified.”

Response:

No discrepancies have been identified between Table 2.1 and Figure 2.1 of the 28113.NIA.01 RevE Noise Impact Assessment report.

Table 2.1 defines the survey locations as follows:

- Position 1: southwest of the site
- Position 2: east of the site

- Position A: northwest of the site at the closest practical position to the M1 motorway.

Figure 2.1 spatially corroborates these positions and demonstrates the relative relationship between the measurement locations and the surrounding site context.

At present, no specific discrepancy between the table and figure has been identified within the consultation comments received from the Local Planning Authority or Environmental Health team.

Nevertheless, the Figure 3.1 presented within this technical memorandum has been overlaid with the proposed site layout in order to provide further clarity regarding the relationship between the survey positions and the proposed development.

4.0 CONCLUSION

This technical memorandum has been prepared in response to comments received from the London Borough of Barnet Environmental Health team and Planning Officer regarding the environmental noise survey methodology presented within the 28113.NIA.01 RevE Noise Impact Assessment report.

As demonstrated throughout this memorandum, the assessment was not based solely upon a single 15-minute attended measurement. The survey methodology incorporated over 91 hours of unattended monitoring at Positions 1 and 2, capturing representative daytime, evening, night-time and peak traffic conditions associated with the M1 motorway.

The attended measurement undertaken at Position A was used as a supplementary façade-specific calibration exercise to establish the relative difference in noise level between the closest practical position to the M1 motorway and the long-term unattended monitoring locations.

Importantly, the dominant noise source affecting all monitoring positions was steady-state motorway traffic associated with the M1. Accordingly, the calibrated Position A data provides a representative and robust basis for deriving worst-case façade noise levels along the western boundary of the development site.

The derived façade noise levels were subsequently used to inform the glazing and ventilation strategy for the development. The enclosed calculations demonstrate that the proposed façade design is capable of achieving compliance with BS8233:2014 and WHO internal noise guidance, including at the façades closest to the M1 motorway.

Accordingly, it is considered that the submitted Noise Impact Assessment, together with the supplementary clarification provided within this memorandum, provides a robust basis upon which the Local Planning Authority can reach an informed planning judgement regarding environmental noise impacts associated with the proposed development.

Any remaining detailed acoustic design matters can be appropriately secured through suitably worded planning conditions during the detailed design stage.

On the basis of the long-term time-history data, the attended Position A measurement, the distance correction and the façade calculations appended to this Technical Memorandum, further attended measurements at Position A would not materially alter the required glazing and ventilation specification or the overall planning conclusion. The submitted information provides a robust basis for assessing the M1-exposed façades and demonstrates that acceptable internal residential noise conditions can be achieved through the specified façade, glazing and ventilation measures.

A summary of the comments raised and the corresponding responses provided within this memorandum is presented in Table 4.1 below.

Comment	Response	Evidence / Action
Position A not at boundary / not nearest to M1.	Position A was located at the closest practical and accessible position to the M1 within the site boundary. The difference in setback distance between Position A and the nearest façades is limited.	Figure 3.1 overlaid with proposed site layout. Distance corrections applied in Section 3.3.
15-minute attended measurement inadequate.	The assessment was not based solely on the attended measurement. Long-term unattended monitoring exceeding 91 hours was undertaken at Positions 1 and 2.	Long-term monitoring data and time histories enclosed within Appendix TH1 and TH2.
Require additional measurements at western boundary.	The attended measurement at Position A was calibrated against long-term unattended monitoring in order to derive representative worst-case façade levels.	Section 3.3 calibration methodology and façade derivation calculations.

Comment	Response	Evidence / Action
Require rush-hour and daytime measurements.	Long-term unattended monitoring captured daytime, evening, night-time, weekday, weekend and peak traffic conditions associated with the M1 motorway.	Continuous monitoring over periods exceeding 91 hours at Positions 1 and 2.
Require results and time history.	Full time-history data showing $L_{Aeq,T}$, L_{AF10} , L_{AF90} and L_{AFmax} measurements have been provided.	Appendix TH1 and TH2 enclosed.
Alleged discrepancy between Table 2.1 and Figure 2.1.	No discrepancies identified between the measurement location descriptions and the survey figure. Additional overlay plan provided for clarification.	Figure 3.1 within this memorandum.

Table 4.1 Summary of comments and responses

GENERAL ACOUSTIC TERMINOLOGY

Decibel scale - dB

In practice, when sound intensity or sound pressure is measured, a logarithmic scale is used in which the unit is the 'decibel', dB. This is derived from the human auditory system, where the dynamic range of human hearing is so large, in the order of 10^{13} units, that only a logarithmic scale is the sensible solution for displaying such a range.

Decibel scale, 'A' weighted - dB(A)

The human ear is less sensitive at frequency extremes, below 125Hz and above 16Khz. A sound level meter models the ears variable sensitivity to sound at different frequencies. This is achieved by building a filter into the Sound Level Meter with a similar frequency response to that of the ear, an A-weighted filter where the unit is dB(A).

L_{eq}

The sound from noise sources often fluctuates widely during a given period of time. An average value can be measured, the equivalent sound pressure level L_{eq} . The L_{eq} is the equivalent sound level which would deliver the same sound energy as the actual fluctuating sound measured in the same time period.

L_{10}

This is the level exceeded for no more than 10% of the time. This parameter is often used as a "not to exceed" criterion for noise.

L_{90}

This is the level exceeded for no more than 90% of the time. This parameter is often used as a descriptor of "background noise" for environmental impact studies.

L_{max}

This is the maximum sound pressure level that has been measured over a period.

Octave Bands

In order to completely determine the composition of a sound it is necessary to determine the sound level at each frequency individually. Usually, values are stated in octave bands. The audible frequency region is divided into 11 such octave bands whose centre frequencies are defined in accordance with international standards. These centre frequencies are: 16, 31.5, 63, 125, 250, 500, 1000, 2000, 4000, 8000 and 16000 Hertz.

Environmental noise terms are defined in BS7445, *Description and Measurement of Environmental Noise*.

APPLIED ACOUSTIC TERMINOLOGY

Addition of noise from several sources

Noise from different sound sources combines to produce a sound level higher than that from any individual source. Two equally intense sound sources operating together produce a sound level which is 3dB higher than a single source and 4 sources produce a 6dB higher sound level.

Attenuation by distance

Sound which propagates from a point source in free air attenuates by 6dB for each doubling of distance from the noise source. Sound energy from line sources (e.g. stream of cars) drops off by 3dB for each doubling of distance.

Subjective impression of noise

Hearing perception is highly individualised. Sensitivity to noise also depends on frequency content, time of occurrence, duration of sound and psychological factors such as emotion and expectations. The following table is a guide to explain increases or decreases in sound levels for many scenarios.

Change in sound level (dB)	Change in perceived loudness
1	Imperceptible
3	Just barely perceptible
6	Clearly noticeable
10	About twice as loud

Transmission path(s)

The transmission path is the path the sound takes from the source to the receiver. Where multiple paths exist in parallel, the reduction in each path should be calculated and summed at the receiving point. Outdoor barriers can block transmission paths, for example traffic noise. The effectiveness of barriers is dependent on factors such as its distance from the noise source and the receiver, its height and construction.

Ground-borne vibration

In addition to airborne noise levels caused by transportation, construction, and industrial sources there is also the generation of ground-borne vibration to consider. This can lead to structure-borne noise, perceptible vibration, or in rare cases, building damage.

Sound insulation - Absorption within porous materials

Upon encountering a porous material, sound energy is absorbed. Porous materials which are intended to absorb sound are known as absorbents, and usually absorb 50 to 90% of the energy and are frequency dependent. Some are designed to absorb low frequencies, some for high frequencies and more exotic designs being able to absorb very wide ranges of frequencies. The energy is converted into both mechanical movement and heat within the material; both the stiffness and mass of panels affect the sound insulation performance.

APPENDIX B(1)

Stoneywood Quarter

EXTERNAL BUILDING FABRIC CALCULATIONS

GLAZING TYPE 1

British Standard BS8233:2014, Section G.2 - Internal noise level calculation method:		
$L_{eq,2} = L_{eq,ff} + 10 \log_{10} \left(\frac{A_0}{S} 10^{-\frac{D_{n,e}}{10}} + \frac{S_{wi}}{S} 10^{-\frac{R_{wi}}{10}} + \frac{S_{ew}}{S} 10^{-\frac{R_{ew}}{10}} + \frac{S_{rr}}{S} 10^{-\frac{R_{rr}}{10}} \right) + 10 \log_{10} \left(\frac{S}{A} \right) + 3$		
$L_{eq,2}$	Sound pressure level in a room (dB).	S is the total area in m^2 of the elements through which sound enters the room.
$L_{eq,ff}$	Equivalent continuous free-field sound pressure level outside the room façade.	$D_{n,e}$ is the insulation of the trickle ventilation measured according to BS EN ISO 10140.
A_0	is a reference absorption area of 10m ² and is independent of frequency.	R_{wi} is the sound reduction index SRI of the window.
S_f	is the total façade area in m^2 of the room in question.	R_{ew} is the sound reduction index SRI of the external wall.
S_{wi}	is the area in m^2 of the windows of the room.	R_{rr} is the sound reduction index SRI of the roof/ceiling.
S_{ew}	is the area in m^2 of the external wall of the room.	A is the equivalent absorption area of receiving room being considered.
S_{rr}	is the area in m^2 of the ceiling of the room.	

Description	Measured External Free-Field Noise Levels (dB)						dBA
	125	250	500	1k	2k	4k	
Daytime Ambient Noise Level (Leq,T)	53	52	55	59	52	39	60
Night-Time Ambient Noise Level (Leq,T)	49	49	52	55	48	37	57
15th Highest Night-time Lmax	64	64	67	69	61	49	71

Room Properties		Sound reduction index of elements (dB) at octave band centre frequency (Hz)						Overall (dB)	
		125	250	500	1k	2k	4k		
Façade width (m)	3	41	43	48	50	55	55	51(-1;-3)	Rw(C; Ctr)
Room height (m)	2.5	20	21	29	38	34	45	32(-1;-4)	Rw(C; Ctr)
Room depth (m)	2.8	35	34	45	38	49	49	39	Dn,e,w
Window area (m ²)	5.4								
No. of trickle Vents	1								

Predicted Internal Noise Levels (dB)							dBA	Criteria
Description	125	250	500	1k	2k	4k		
Daytime Ambient Noise Level (Leq,T)	37	36	27	26	18	-4	32	35
Night-Time Ambient Noise Level (Leq,T)	34	32	25	23	14	-6	28	30
15th Highest Night-time Lmax	49	47	40	37	27	6	43	45

APPENDIX B(2)

Stoneywood Quarter

EXTERNAL BUILDING FABRIC CALCULATIONS

GLAZING TYPE 2

British Standard BS8233:2014, Section G.2 - Internal noise level calculation method:			
Leq,2	Sound pressure level in a room (dB).	S	is the total area in m2 of the elements through which sound
Leq,ff	Equivalent continuous free-field sound pressure level outside	Dn,e	is the insulation of the trickle ventilation measured
A0	is a reference absorption area of 10m2 and is independent of	Rwi	is the sound reduction index SRI of the window.
Sf	is the total façade area in m2 of the room in question.	Rew	is the sound reduction index SRI of the external wall.
Swi	is the area in m2 of the windows of the room.	Rrr	is the sound reduction index SRI of the roof/ceiling.
Sew	is the area in m2 of the external wall of the room.	A	is the equivalent absorption area of receiving room being
Srr	is the area in m2 of the ceiling of the room.		

Description	Measured External Free-Field Noise Levels (dB)						dBA
	125	250	500	1k	2k	4k	
Daytime Ambient Noise Level (Leq,T)	53	51	51	54	47	33	56
Night-Time Ambient Noise Level (Leq,T)	49	47	47	49	41	29	51
15th Highest Night-time Lmax	59	55	64	62	52	40	65

Room Properties	
Façade width (m)	3
Room height (m)	2.5
Room depth (m)	2.8
Window area (m2)	5.4
No. of trickle Vents	1

Element	Sound reduction index of elements (dB) at octave band centre frequency (Hz)						Overall (dB)	
	125	250	500	1k	2k	4k		
Non-Glazed	41	43	48	50	55	55	51(-1;-3)	Rw(C; Ctr)
Glazing	24	20	25	35	38	35	31(-1;-4)	Rw(C; Ctr)
Trickle Vents	30	31	31	32	28	28	31	Dn,e,w

Description	Predicted Internal Noise Levels (dB)						dBA	Criteria
	125	250	500	1k	2k	4k		
Daytime Ambient Noise Level (Leq,T)	35	36	29	27	21	8	32	35
Night-Time Ambient Noise Level (Leq,T)	31	31	25	21	16	3	28	30
15th Highest Night-time Lmax	41	40	42	35	26	15	41	45

APPENDIX B(3)

Stoneywood Quarter

EXTERNAL BUILDING FABRIC CALCULATIONS

GLAZING TYPE 3

British Standard BS8233:2014, Section G.2 - Internal noise level calculation method:			
Leq,2	Sound pressure level in a room (dB).	S	is the total area in m2 of the elements through which sound
Leq,ff	Equivalent continuous free-field sound pressure level outside	Dn,e	is the insulation of the trickle ventilation measured
A0	is a reference absorption area of 10m2 and is independent of	Rwi	is the sound reduction index SRI of the window.
Sf	is the total façade area in m2 of the room in question.	Rew	is the sound reduction index SRI of the external wall.
Swi	is the area in m2 of the windows of the room.	Rrr	is the sound reduction index SRI of the roof/ceiling.
Sew	is the area in m2 of the external wall of the room.	A	is the equivalent absorption area of receiving room being
Srr	is the area in m2 of the ceiling of the room.		

Description	Measured External Free-Field Noise Levels (dB)						dBA
	125	250	500	1k	2k	4k	
Daytime Ambient Noise Level (Leq,T)	56	55	57	61	54	41	63
Night-Time Ambient Noise Level (Leq,T)	52	51	55	58	50	39	60
15th Highest Night-time Lmax	67	66	70	72	64	51	74

Room Properties	
Façade width (m)	3
Room height (m)	2.5
Room depth (m)	2.8
Window area (m2)	5.4
No. of trickle Vents	1

Element	Sound reduction index of elements (dB) at octave band centre frequency (Hz)						Overall (dB)	
	125	250	500	1k	2k	4k		
Non-Glazed	41	43	48	50	55	55	51(-1;-3)	Rw(C; Ctr)
Glazing	20	25	29	38	34	45	33(-1;-4)	Rw(C; Ctr)
Trickle Vents	35	34	34	38	49	49	39	Dn,e,w

Predicted Internal Noise Levels (dB)							dBA	Criteria
Description	125	250	500	1k	2k	4k		
Daytime Ambient Noise Level (Leq,T)	39	33	32	29	20	-1	34	35
Night-Time Ambient Noise Level (Leq,T)	35	30	29	25	16	-3	30	30
15th Highest Night-time Lmax	50	45	45	39	30	8	45	45

Stoneywood Quarter - Position 1
Environmental Time History
12/12/2024 to 16/12/2024

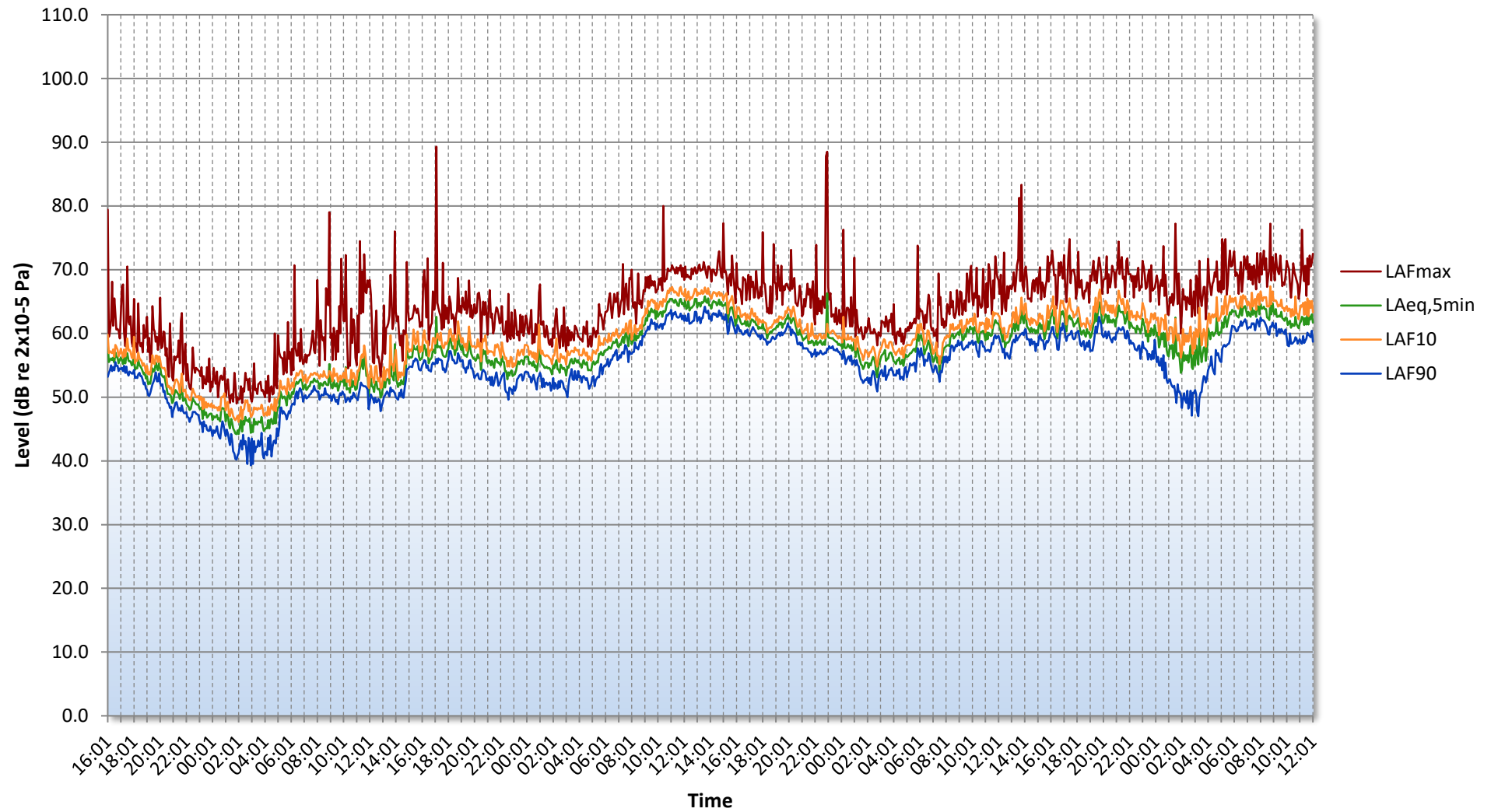


Figure 28113.TH1

Stoney Wood Quarter - Position 2
Environmental Time History
12/12/2024 to 16/12/2024

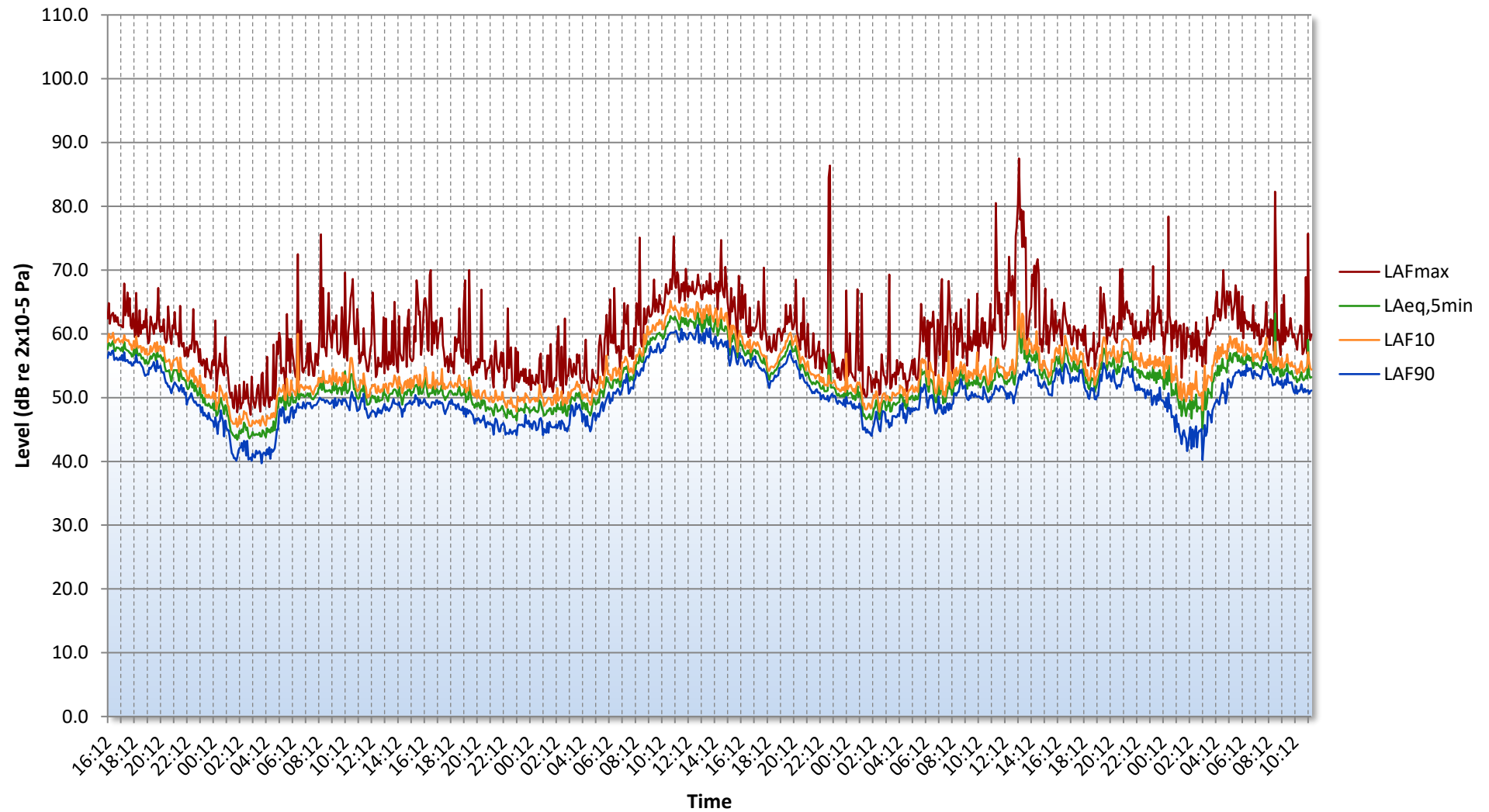


Figure 28113.TH2

STONEY WOOD QUARTER

Land North of The Fairway, London NW7 3HS

AIR QUALITY POSITIVE STATEMENT

On behalf of Stoney Wood Property Developments Ltd

Prepared by London Placemaking

March 2026

Project:	Stoney Wood Quarter
Document:	Air Quality Positive Statement
Prepared by:	London Placemaking
Date:	March 2026

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1. Introduction

1.1 Purpose of this Statement

This Air Quality Positive (AQP) Statement has been prepared by London Placemaking in support of the full planning application for the proposed development at Stoney Wood Quarter (SWQ), Land North of The Fairway, London NW7 3HS.

It has been prepared in accordance with the Mayor of London's Air Quality Positive London Plan Guidance (LPG) published in February 2023 and responds to the requirements of London Plan Policy SI 1 (Improving Air Quality – Part C). The Planning Application is referable to the Mayor of London under Category 1A of the Town and Country Planning (Mayor of London) Order 2008 (as amended) and is accompanied by an Environmental Statement (ES) coordinated by HgH Consulting.

This AQP Statement should be read in conjunction with the following supporting documents that have been submitted as part of the Planning Application:

- Air Quality Assessment (AQE, November 2025) – ES Appendix 6.1
- ES Volume I, Chapter 6: Air Quality (HgH Consulting / AQE)
- ES Volume I, Chapter 8: Ecology (HgH Consulting / Phlorum)
- ES Volume I, Chapter 12: Transport (HgH Consulting / Lime Transport)
- Healthy Streets Transport Assessment (Lime Transport, November 2025)
- Travel Plan (Lime Transport, November 2025)
- Outline Construction Logistics Plan (Lime Transport, November 2025)
- Energy and Sustainability Statement (Irvineering)
- Design and Access Statement (London Placemaking, November 2025)
- Preliminary Ecological Appraisal (Phlorum)
- Biodiversity Net Gain Assessment (Phlorum Ltd)
- Arboricultural Impact Assessment (Quaife Woodlands)
- Soft Landscaping Specification (London Placemaking)
- Illustrated Planting Schedule (London Placemaking)
- Draft Landscape and Ecology Management Plan (London Placemaking)
- Urban Greening Factor Assessment (London Placemaking)

1.2 Description of the Development

Full planning permission is sought for the redevelopment of the site for residential use (Class C3), in buildings up to ground plus 5 storeys with ancillary flexible commercial spaces (Use Class E) at ground floor level, together with plant, play space, car and cycle parking, hard and soft landscaping and all other works associated with the development.

The Proposed Development comprises 463 residential dwellings proposed as a Build to Rent scheme with 50% affordable housing. The total GIA is 43,057 sqm in residential floorspace, together with 597 sqm of flexible Class E uses including a gym, co-working space, concierge, retail, community space, children's soft play, woodland club, and café.

Key development elements relevant to this AQP Statement include:

- 151 car parking spaces (0.33 per unit), including 14 Blue Badge and 2 car club spaces, with 135 in a basement car park and 16 at ground level.
- 856 cycle parking spaces (843 long-stay, 13 short-stay), including 42 adaptive spaces

- All-electric energy strategy: communal air source heat pumps (SCoP 3.38–3.41) and PV panels (c.79,023 kWh/year)
- 75% CO₂ reduction over Part L 2021 (57% renewable, 18% efficiency)
- MVHR with hybrid cooling where required
- Urban Greening Factor of 0.5 (exceeding 0.4 target)
- 3,536 sqm play provision (exceeding 2,447 sqm London Plan requirement)
- Extensive green and blue roofs
- EV charging

1.3 Method Statement

Air quality considerations have been integrated into the design process from the earliest stages of the project. The design team, in particular London Placemaking (architects and landscape architects), Lime Transport (transport), AQE (air quality), Irvineering (energy), and Phlorum (ecology) have worked collaboratively to ensure that air quality benefits are maximised across all aspects of the scheme.

The Air Quality Positive approach has been informed by pre-application engagement with key stakeholders:

- GLA strategic briefing (March 2025): Design, quantum, massing and sustainability aspirations were presented and welcomed.
- TfL scoping meeting (April 2025): Low car parking was considered acceptable subject to a package of sustainable transport measures. Cycle parking provision in accordance with the London Plan was confirmed.
- GLA formal pre-application (May 2025): The proposals were strongly supported in principle. The GLA advised that the scheme should be supported by a robust transport strategy to improve accessibility by sustainable modes, noting the low existing PTAL.
- LBB Officer meetings: The parking strategy was revised and reduced following consultation. LBB Ecology Officers requested revisions to the building layout at the northwestern corner to maintain clusters of existing trees and woodland.

Technical air quality expertise has informed the site layout, building orientation, energy strategy, ventilation design, transport strategy, and landscaping proposals. The approach has considered the four key themes set out in Section 3 of the GLA guidance: better design and reducing exposure; building emissions; transport emissions; and innovation and futureproofing.

2. Constraints and Opportunities

This section sets out the air quality context of the Site and identifies the constraints and opportunities that have informed the design of the Proposed Development. In accordance with GLA guidance (paragraph 4.3.3), it provides evidence of how the air quality context has shaped the design process, supported by mapping from the Air Quality Assessment (AQE, November 2025).

2.1 Site Context

The Site comprises approximately 1.76 hectares of previously developed land located on the northern side of The Fairway in the north of the London Borough of Barnet. It is bounded by Stoney Wood and Stoney Wood Lake to the north, Mill Hill Golf Course to the northeast, Fairway Primary School and Children's Centre to the east, existing residential properties along The Fairway to the south, and further residential properties and a former car scrap yard to the west. The M1 Motorway and associated railway line run in a north-south alignment approximately 200m to the northwest of the Site.

The Site currently comprises a cleared area of hardstanding following demolition of previous school buildings in the 2010s, with clusters of existing trees concentrated along the northern boundary. Access is via The Fairway, a secondary road connecting directly to the A1 Barnet Way. The location of the Site in relation to the surrounding highway network is illustrated in Figure 2.1 below.

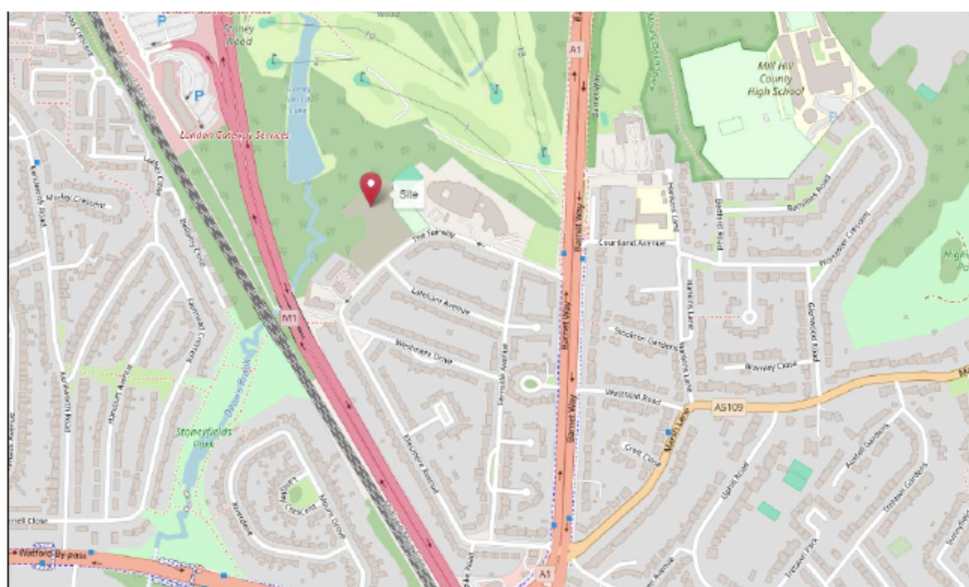


Figure 2.1: Site Location in Relation to the Local Highway Network

The wider area is characterised by a mix of suburban residential development to the south and east, with significant green and open spaces to the north and west including Stoney Wood (a Site of Importance for Nature Conservation), the associated watercourse and lake, Mill Hill Golf Course, and the wider Green Belt. The M1 corridor to the west is a source of regional traffic emissions, although it is well separated from the Site by the intervening woodland, railway, and topography.

2.2 Baseline Air Quality

The London Borough of Barnet has declared an Air Quality Management Area (AQMA) across the entire borough for exceedances of the annual mean NO₂ objective and the 24-hour mean PM₁₀ objective. However,

the Site itself is located in an area where background pollutant concentrations are well below the relevant Air Quality Objectives.

The AQE Air Quality Assessment (Section 4) reports the Defra background map concentrations for the 1km grid square containing the Site. These confirm that annual mean concentrations of NO₂, PM₁₀, and PM_{2.5} are all below the national objectives. The assessment also reviews data from LBB's automatic and non-automatic monitoring stations (see AQE Figures 4.1 and 4.2), which confirm that exceedances of air quality objectives in the borough are concentrated along major road corridors, not at the Site's location.

AQE's dispersion modelling (Section 6) confirms that both baseline (2022) and future year (2029) predicted concentrations at all assessed receptor locations are below the relevant objectives for NO₂, PM₁₀, and PM_{2.5}. The assessment concludes that air quality does not pose a constraint to the residential redevelopment of the Site. The locations of existing sensitive receptors modelled by AQE are shown in Figure 2.2 below.

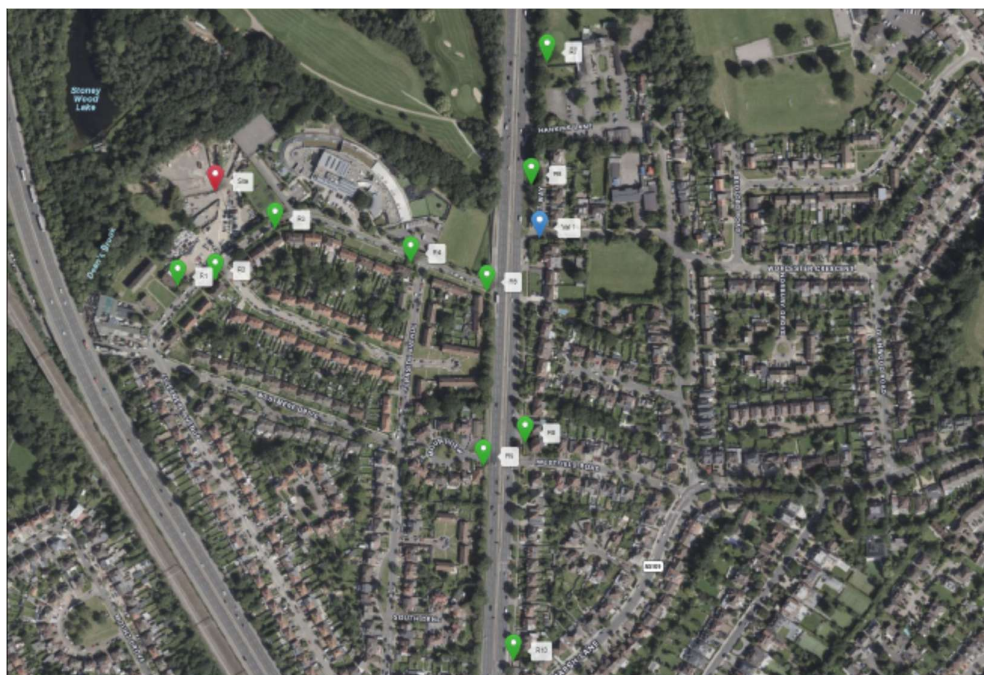


Figure 2.2: Existing Sensitive Receptor Locations (Source: AQE)

The prevailing wind direction is from the south-west, as illustrated by the London City Windrose at Figure 2.3.

The Air Quality Assessment (AQE, November 2025) also includes an Air Quality Neutral (AQN) assessment at Appendix B, prepared in accordance with the GLA's Air Quality Neutral and Air Quality Positive London Plan Guidance (February 2023). The assessment confirms that the Proposed Development meets the AQN benchmarks for both building emissions and transport emissions. The scheme is therefore eligible to pursue Air Quality Positive status, as demonstrated by this Statement.

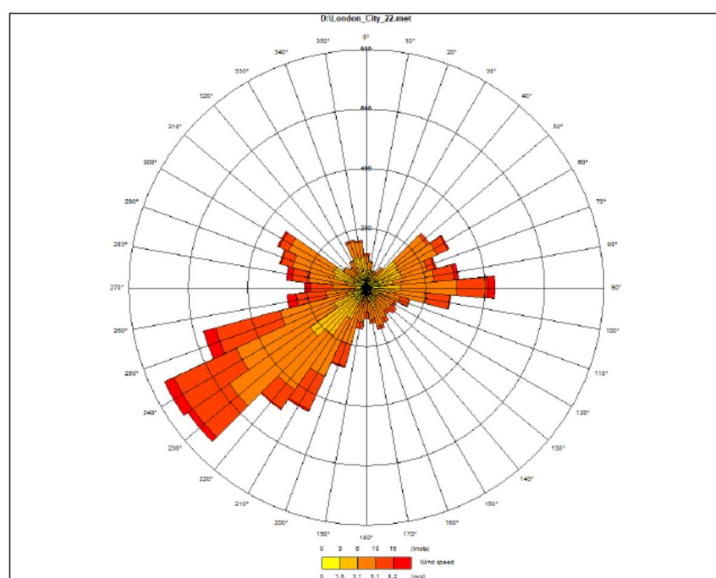


Figure 2.3: London City Windrose, 2022 (Source: AQE)

2.3 Air Quality Constraints

The following air quality constraints have been identified through the baseline assessment work undertaken by AQE and the wider design team and have directly informed the design and layout of the Proposed Development.

Borough-wide AQMA designation: The entire London Borough of Barnet is declared as an AQMA for exceedances of the annual mean NO₂ and 24-hour mean PM₁₀ objectives. While the Site itself does not experience exceedances, the AQMA designation means that all new development must demonstrate how it will contribute to improving air quality in the borough, not merely avoid worsening it. This establishes the policy context within which the Air Quality Positive approach operates.

The Fairway – local traffic emissions: The Fairway runs along the Site's southern boundary and is the primary vehicular access route. It connects to the A1 Barnet Way and carries local traffic serving the surrounding residential area and Fairway Primary School. While traffic volumes are modest compared to major arterial routes, The Fairway represents the nearest source of vehicle-related NO₂ and particulate matter to the development. The AQE assessment includes traffic flow data on this route (see AQE Table 6.1 and Section 6) and has modelled the contribution of road traffic to pollutant concentrations at the Site boundary.

M1 Motorway and railway corridor: The M1 and its associated railway line run approximately 200m to the west of the Site. This is a significant regional emissions source. However, the intervening distance, topography, and the extensive woodland and vegetation of Stoney Wood provide substantial separation and natural filtration. The AQE baseline assessment and dispersion modelling account for the contribution of the M1 to background concentrations at the Site.

Fairway Primary School and Children's Centre: This school is located immediately to the east of the Site and is classified as a highly sensitive receptor under IAQM guidance. The proximity of the school requires particular care in the design of the development's eastern boundary, the positioning of vehicle access and servicing routes, and the management of construction dust. The school is identified as a receptor in AQE's assessment (Figure 6.1) and has been a key consideration in the transport and construction logistics strategies.

Existing residential receptors: Detached and semi-detached dwellings along the southern side of The Fairway and Fairway Court to the south-west are sensitive receptors that may be affected by changes in local

traffic patterns and construction activity. These are identified and modelled in the AQE assessment (Table 6.2).

Construction-phase dust and emissions: The construction of 463 dwellings and associated infrastructure will generate temporary dust emissions and construction traffic. The AQE Construction Dust Risk Assessment (AQE Appendix A) was completed in accordance with IAQM guidance (2024 v2.2) and classifies the site as presenting a low to medium risk of dust impacts prior to mitigation. Specifically, earthworks activities are assessed as low risk for dust soiling, while the construction and trackout phases are assessed as medium risk. Human health and ecological risks are assessed as low to negligible across all construction stages. Site-specific mitigation measures appropriate to these risk levels are set out in the CDRA and will be secured by pre-commencement planning condition as part of the detailed CEMP. The proximity of the school and existing dwellings means that robust construction management will be essential throughout the build programme.

Low PTAL rating: The Site has a low Public Transport Accessibility Level, reflecting its suburban edge-of-green-belt location. This presents a challenge for achieving the modal shift away from private car use that is central to reducing transport-related emissions. The constraint has been addressed through a combination of low car parking provision (0.33 ratio), the provision of significant amounts of amenity on site to reduce the need for car travel, generous cycle parking (856 spaces), car club provision, and a Travel Plan with monitoring targets. S106 contributions to public transport improvements are also proposed.

2.4 Air Quality Opportunities

Alongside the constraints identified above, the Site presents several significant opportunities to deliver genuinely positive air quality outcomes. These opportunities have been central to the design process and have shaped the energy strategy, transport approach, landscape design, and building layout.

Low baseline pollution levels: The AQE assessment confirms that existing background concentrations at the Site are below the national Air Quality Objectives for all assessed pollutants. This provides a strong baseline from which to deliver further improvement. The development is not attempting to mitigate an existing poor air quality environment; rather, it is building on already favourable conditions to create an exemplary residential environment.

Stoney Wood, Green Belt, and ecological corridor: The Site is bounded to the north and west by Stoney Wood, a designated Site of Importance for Nature Conservation (SINC), and the wider Green Belt. This substantial body of mature woodland and open land provides a natural clean air buffer, filtering particulate matter, absorbing gaseous pollutants, and generating oxygen. The watercourse running along the northern boundary provides an ecological corridor connecting the Site to the wider green network. The development's landscape strategy has been designed to strengthen this connection, using native riparian planting to extend the woodland character into the scheme. The existing tree cluster along the northern boundary (71 trees retained, including Category A and B specimens) are preserved and supplemented with new planting.

Cleared site with no existing emission sources: The Site was cleared following demolition in the 2010s and currently comprises hardstanding with no buildings, industrial processes, or energy infrastructure. This 'blank canvas' condition means there are no legacy emission sources to manage, no contaminated heating systems to decommission, and no constraints on adopting a fully zero-emission energy strategy from the outset.

All-electric energy potential: The absence of any existing energy infrastructure or connection to a district heat network means the development can implement a fully electric energy strategy without the need to accommodate or transition from combustion-based systems. Air source heat pumps and photovoltaic panels deliver zero on-site combustion emissions, meaning no direct NO_x or particulate matter is produced on-site from space heating or hot water generation. This is the single most significant air quality positive measure available for a new residential development.

Scale for meaningful green infrastructure: At 1.76 hectares with 463 units, the Site is large enough to deliver meaningful green infrastructure at a scale that has a genuine impact on local air quality and microclimate. The scheme includes significant green and blue roofs, native hedgerows, wildflower meadow seeding, wetland/riparian planting, façade planting, and an uplift in tree numbers. All species are drawn from the RHS Pollinator-Friendly list and selected to reflect the established flora of the adjacent SINC and woodland.

Transport infrastructure and modal shift: While the low PTAL is a constraint, the site's scale allows for 856 cycle parking spaces (including 42 adaptive), an internal pedestrian-priority street network, 2 car club spaces, and a comprehensive Travel Plan. The scheme delivers a car parking ratio of just 0.33 spaces per dwelling, representing a substantial reduction from the initial proposals following GLA and TfL advice. The combination of generous cycle provision, restricted car parking, and on-site amenities (gym, co-working, café, retail) is designed to reduce the need for car-based trips and encourage active travel, delivering measurable reductions in transport-related emissions.

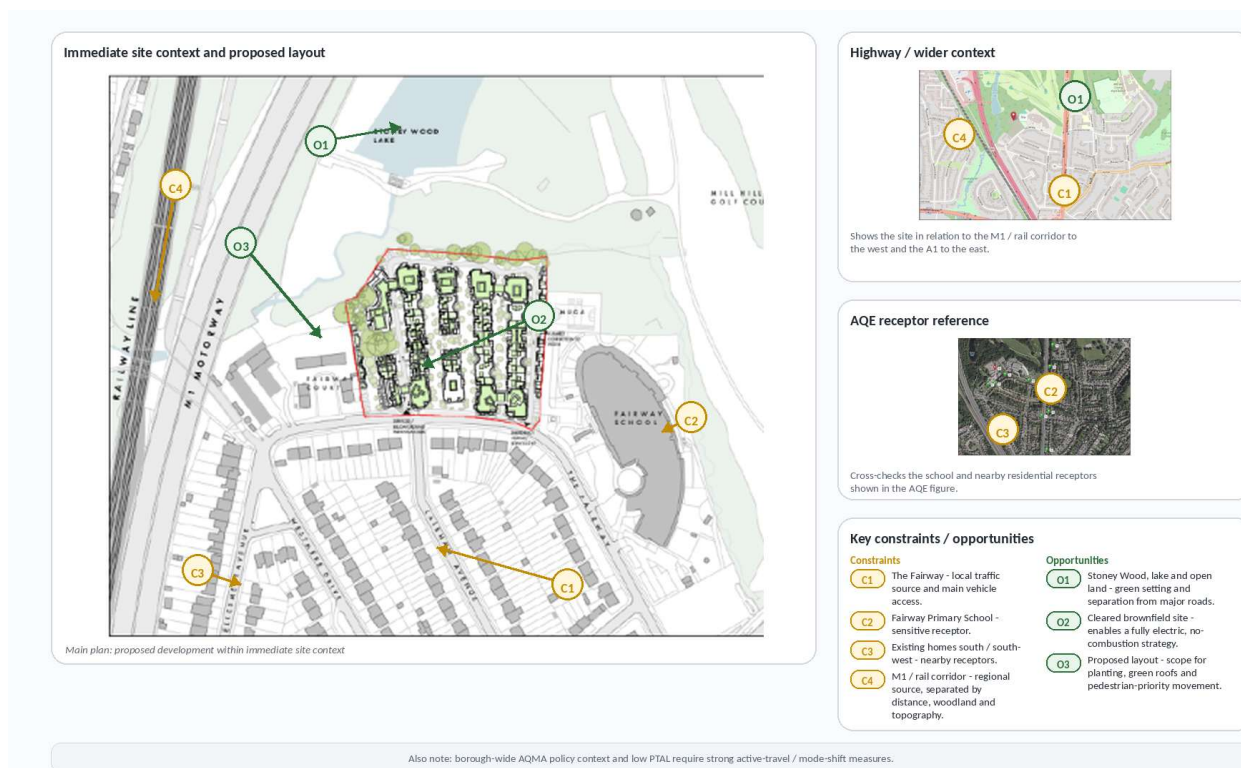


Figure 2.4: Air Quality Constraints and Opportunities Plan summarising figures 2.1, 2.2 and 2.3

2.5 Summary of Design Response

The constraints and opportunities analysis set out above has directly shaped the design of the Proposed Development. The table below summarises how each constraint has been addressed and how each opportunity has been exploited.

Constraint / Opportunity	Design Response
AQMA designation	All-electric energy strategy with zero on-site combustion. Low car parking and Travel Plan reduce transport emissions. Net positive contribution to borough AQMA objectives.
The Fairway – traffic emissions	Buildings set back from road. Play areas and public realm located internally. Vehicle access confined to perimeter loop. Basement car parking minimises ground-level emissions.
M1 / railway corridor	Stoney Wood retained as natural buffer. NW building layout was revised to preserve tree clusters. Native planting reinforces green screening.
Fairway Primary School	Eastern boundary designed sensitively. Vehicle access and servicing routes directed away from school. Construction dust management measures in OCLP/CEMP.
Residential receptors	Stepped massing reduces visual and environmental impact. Construction traffic managed via CLP. Operational traffic modelled as low impact (AQE Section 5).
Construction dust	AQE Appendix A Dust Risk Assessment. OCLP submitted. Detailed CEMP/CLP secured by pre-commencement condition.
Low PTAL	0.33 car parking ratio. 856 cycle spaces. 2 car club spaces. Travel Plan with modal shift targets. S106 contributions to public transport.

Constraint / Opportunity	Design Response
Low baseline pollution	Exploited by locating high-quality outdoor amenity within site. Provides strong foundation for AQP approach.
Woodland / Green Belt / SINC	71 trees retained. Planting creates an uplift in tree numbers. Native planting to extend woodland character. Riparian margin enhancement. LEMP for long-term management.
Scale for green infrastructure	UGF 0.5. 1,158m ² green roof + 1,781m ² blue roof. Wildflower meadows. Native hedges. Façade planting. All RHS Pollinator-Friendly.
Cleared site	All-electric strategy from outset. No legacy systems. Optimised layout without constraints.

3. Measures Adopted

This section sets out the Air Quality Positive measures adopted across the four key themes of the GLA guidance. The measures are summarised in the AQP Matrix at Table 3.1, with supporting narrative below. Where measures are not being implemented, a rationale is provided (in accordance with GLA guidance paragraph 4.3.9).

3.1 Theme A: Better Design and Reducing Exposure

Optimised Site Layout: The site layout has been designed to maximise air quality conditions for future residents. Residential buildings are set back from The Fairway, with the primary public realm, communal gardens, and play areas located within the interior of the site, away from the road corridor. The massing steps down towards the site boundaries to reduce potential street canyon effects and promote natural air dispersion. The northwestern building layout was specifically revised following LBB Ecology Officer consultation to retain clusters of existing trees and landmark trees forming woodland clusters, which act as natural air filters and ecological habitat.

Separation of Vehicles from Sensitive Uses: Vehicle movements are confined to a one-way perimeter loop, with 135 of 151 car parking spaces located in the basement. Blue Badge spaces (14 no.) and car club spaces (2 no.) are at ground level near the site entrance. This arrangement concentrates vehicle emissions at the site periphery and below ground, minimising exposure within the communal gardens, Play Street, and public realm. Refuse, emergency, and servicing vehicles follow the same perimeter route, avoiding the pedestrian-priority interior.

Mechanical Ventilation with Heat Recovery (MVHR): All 463 units are fitted with MVHR providing continuous filtered fresh air. Additional hybrid cooling units maintain thermal comfort in units where windows must remain closed due to background noise. This dual system, designed in accordance with London Plan Policy SI 4, will reduce occupant exposure to external pollutants and minimise reliance on opening windows in circumstances where external noise make this less desirable. The intended filter specification and maintenance regime will be detailed in the building services strategy, which will be secured by planning condition requiring submission and approval of the strategy prior to occupation..

Green Infrastructure (UGF 0.5): The Proposed Development achieves an Urban Greening Factor of 0.5, exceeding the London Plan Policy G5 target of 0.4 for predominantly residential schemes. Measures include 1,158m² of intensive green roof with dry native wildflowers and fine grasses; 1,781m² of blue roof with biodiverse wet-tolerant native wildflowers; native hedgerows (hawthorn, blackthorn, dog-rose, field maple); wildflower meadow seeding; and wetland/riparian margin planting along the watercourse buffer. All roof and planter species are from the RHS Pollinator-Friendly Species List. The tree strategy achieves a 31% uplift (150 existing to 197 proposed), with 71 trees retained including 6 Category A and 8 Category B specimens. These measures contribute to particulate deposition, NO_x absorption, improved air circulation, and reduced urban heat island effect. Full details are in the Soft Landscaping Specification and Illustrated Planting Schedule.

Public Realm and Play Provision: 3,536 sqm of play provision is located within the site interior, exceeding the GLA requirement of 2,447 sqm. The dedicated 'Play Street' concept creates a traffic-free zone. The generous landscaped public realm along The Fairway frontage is set back from the carriageway and surrounded by active uses.

3.2 Theme B: Building Emissions

All-Electric Energy Strategy – Zero On-Site Combustion: The Proposed Development adopts a fully electric energy strategy with zero on-site combustion. There are no gas boilers, no CHP plant, and no other combustion-based heating systems. There will be no direct on-site emissions of NO_x or PM from space heating or hot water generation. The strategy also delivers a substantial reduction in regulated carbon emissions compared with the Part L 2021 baseline, as set out in the Energy and Sustainability Statement (Irvineering). The energy system comprises communal air source heat pumps (3 no. modular

SAV/Thermonova DELTA-HP units, SCoP 3.38–3.41) providing all space heating and domestic hot water via heat interface units, distributed through underfloor heating or low-temperature radiators. PV panels on flat roofs generate approximately 79,023 kWh/year (SAP10.2). Collectively, the Energy Statement demonstrates a 75% regulated CO₂ reduction over Part L 2021, substantially exceeding the London Plan's 35% minimum target. Of this reduction, 57% is attributable to renewable energy sources and 18% to energy efficiency measures. The remaining balance to achieve net zero carbon is to be met by a carbon offsetting contribution secured through the Section 106 agreement. Full details are in the Energy and Sustainability Statement.

Non-Heating PM_{2.5} Sources: The waste strategy uses underground/iceberg bins with hiab collection, minimising vehicle frequency within the site. No large-scale commercial kitchen or hot-food takeaway use is proposed as part of the current scheme. Any future extract or ventilation serving the café or other Class E food and drink uses will be subject to detailed design controls and, where necessary, separate approval to ensure cooking-related emissions are appropriately managed.

3.3 Theme C: Transport Emissions

Low Car Parking (0.33 ratio): 151 car parking spaces for 463 units, well below both the London Plan maximum (up to 1.5 per dwelling, Policy T4.1) and LBB Local Plan maximums. The provision was substantially reduced following pre-application advice from the GLA and TfL, who expressed a strong preference for sustainable transport modes. This is a direct, measurable commitment to reducing transport-related emissions.

Generous Cycle Parking (856 spaces): 843 long-stay resident spaces and 13 short-stay visitor spaces, including 42 adaptive cycle spaces and 801 two-tier racks, designed to London Cycling Design Standards. This exceeds London Plan Policy T5 minimums and is designed to be at least as convenient as car parking, supporting active travel as the primary mode.

EV Charging Infrastructure: Active EV charging from first occupation with passive provision (ducting and capacity) for future activation. This supports both the Mayor's Transport Strategy and the national zero-emission vehicle transition.

Car Club (2 spaces): Two dedicated car club spaces at ground level reduce the need for private car ownership and associated per-household emissions.

Healthy Streets and Active Travel: The scheme is designed in accordance with the Mayor's Healthy Streets Approach (London Plan Policies T1 and T2). The internal street network prioritises pedestrians and cyclists, with the vehicle loop confined to the perimeter. A Travel Plan (Lime Transport) will be secured via S106, with modal shift targets, monitoring, and enforcement mechanisms.

Travel Plan - Modal Shift Targets: The Travel Plan (Lime Transport, November 2025) sets out headline modal shift targets to be monitored and enforced via the S106 agreement. Against a TRICS-derived baseline car driver mode share of 43%, the Travel Plan establishes an interim target of 41% at Year 1 post-occupation, reducing to 39% by Year 5. Corresponding targets are set for walking and cycling (rising from 25% to 29% by Year 5) and public transport use (rising from 16% to 20% by Year 5). Baseline figures will be updated following resident travel surveys after substantial occupation, with targets adjusted accordingly. If car mode share exceeds the target at any monitoring point, a trigger review will be initiated and remedial measures implemented.

Construction Logistics: An Outline Construction Logistics Plan (Lime Transport) is submitted with the application. A detailed CLP and CEMP will be secured by pre-commencement condition, including measures for dust management and emission controls in accordance with the GLA SPG on The Control of Dust and Emissions During Construction and Demolition (2014). The AQE Construction Dust Risk Assessment (AQE Appendix A) provides a site-specific assessment of construction dust risk.

3.4 Theme D: Innovation and Futureproofing

Future-Proofed Energy System: The all-electric strategy is inherently future-proofed. As the national grid continues to decarbonise, the development's carbon intensity and air quality impact will reduce progressively. No combustion systems require future retrofitting. The modular ASHP system allows capacity management without introducing emission sources.

District Heat Network Connection: There is no district heat network currently available to connect to but provision has been made to enable connection (including a DEN room) should a network come forward in the future in the vicinity.

Ecological Enhancement and Maturing Landscape: The on-site native planting programme, green and blue roofs, wildflower meadows, and riparian margin enhancements provide substantial ecological and air quality co-benefits that will increase as vegetation matures. All species are selected from the RHS Pollinator-Friendly list. Statutory BNG compliance is addressed through the dedicated ecology and BNG documentation submitted with this application, including the provision of off-site biodiversity credits where necessary.

Smart Waste Management: Underground/iceberg bins reduce collection vehicle frequency, minimise idling, and improve the street environment – delivering air quality and amenity benefits beyond conventional waste arrangements.

Be Seen Energy Monitoring: Post-occupation energy monitoring in accordance with the GLA's Be Seen LPG (March 2022) will track actual performance against design predictions, providing ongoing accountability.

3.5 Measures Not Adopted

Connection to an existing heat network: There is no existing or planned district heat network within viable connection distance of the Site. The Energy and Sustainability Statement (Irvineering) confirms that no heat network opportunity has been identified in the vicinity. The all-electric ASHP strategy is the most appropriate zero-emission heating solution in this context, and is inherently more beneficial for local air quality than any combustion-based heat network alternative, as it produces no on-site NOx or particulate emissions. Having said that provision has been made to enable connection if the heat network is expanded to the vicinity.

Car-free development: Given the Site's low PTAL rating, a fully car-free development was not considered realistic or appropriate in this location. The Healthy Streets Transport Assessment (Lime Transport) sets out the accessibility constraints of the site. The provision of 14 Blue Badge spaces (3% of units) is a policy requirement to ensure inclusive access. The 0.33 parking ratio nonetheless represents a substantial reduction from the initial proposals (which included considerably more parking) following direct feedback from the GLA and TfL at pre-application stage. Further reductions in car dependency will be pursued through the Travel Plan, car club provision, and S106 contributions to public transport improvements.

On-site operational air quality monitoring: Given that baseline pollutant concentrations at the Site are well below objective levels (as demonstrated by AQE's dispersion modelling in Section 6 of the Air Quality Assessment), and that the development introduces no on-site combustion sources, permanent air quality monitoring infrastructure is not considered proportionate in this location. The borough-wide monitoring network maintained by LBB (see AQE Figures 4.1 and 4.2) and Defra background mapping provide adequate ongoing surveillance. Construction-phase dust monitoring will be undertaken as part of the CEMP, and transport-related impacts will be tracked through the Travel Plan monitoring regime. These project-specific monitoring measures are considered to provide appropriate and proportionate coverage.

Table 3.1 Air Quality Positive Matrix

Measure	Summary of the measure	Reason for undertaking measure	Expected benefits	Assessment methods		How this measure will be secured
				Quantitative reporting	Qualitative reporting	
A. Better design and reducing exposure						
Optimised site layout	Buildings set back from The Fairway. Play areas and public realm located internally. NW corner revised to retain tree clusters.	Reduce exposure of sensitive receptors to traffic pollution.	Expected to reduce exposure relative to roadside locations by siting play and communal amenity away from the principal traffic corridor (AQE Fig 6.1 receptor analysis).	-	Design review informed by AQE receptor assessment and baseline modelling. Site layout rationale set out in DAS.	Approved drawings/ Planning Permission
Vehicle separation	One-way perimeter loop. 135/151 parking spaces in basement. Pedestrian and cycle priority interior.	Minimise ground-level exposure to vehicle exhaust.	Basement parking removes majority of vehicle emissions from ground level. Perimeter routing directs residual emissions away from communal areas.	-	Transport and design review. Servicing strategy in HSTA.	Approved drawings/ Planning Permission; HSTA.
MVHR with hybrid cooling	All 463 units with MVHR and hybrid cooling for filtered fresh air supply.	Reduce occupant exposure to external pollutants; minimise reliance on window opening.	Filtered air supply reducing exposure to traffic-related pollutants. Filter specification and maintenance regime to be detailed in building services strategy.	-	Building services design in accordance with London Plan Policy SI 4. See Energy Statement; DAS.	Planning condition (building services strategy).
Green infrastructure (UGF 0.5)	1,158 sqm green roof + 1,781 sqm blue roof. Native hedges, wildflower meadows. 197 trees (31% uplift).	Increase vegetated surface area; contribute to pollutant uptake and improved microclimate.	Qualitative co-benefit: increased particulate deposition surfaces and gaseous pollutant uptake. Reduced urban heat island. Quantified via UGF assessment (0.5 vs 0.4 target).	UGF calculation (London Placemaking): 0.5 achieved against 0.4 target. See UGF Assessment.	Qualitative landscape and ecological assessment. See Landscape Plans; Planting Specification.	Approved landscaping plans; LEMP condition.
Play and public realm positioning	3,536 sqm play provision internally (exceeds 2,447 sqm GLA requirement).	Locate sensitive outdoor spaces away from pollution sources.	Reduced exposure for children and families by siting play areas within	-	Design review. See DAS; Landscape Plans.	Approved plans.

Measure	Summary of the measure	Reason for undertaking measure	Expected benefits	Assessment methods		How this measure will be secured
				Quantitative reporting	Qualitative reporting	
	Traffic-free Play Street.		the interior of the site, away from The Fairway and vehicle access route.			
Stepped massing	Building heights reduce towards boundaries and Green Belt.	Promote natural air dispersion; avoid street canyon effects.	Better air circulation across the site; reduced risk of pollutant accumulation.	-	Massing studies in DAS.	Approved plans.
B. Building emissions						
All-electric energy strategy (zero on-site combustion)	Communal ASHP (SCoP 3.38-3.41). No gas, no CHP, no boilers.	Eliminate direct on-site air pollutant emissions from heating and hot water.	Zero on-site NOx and PM from space heating and hot water generation. Significant regulated CO2 reduction (75% over Part L 2021).	Energy Statement modelling (Irvineering). Part L calculations. 75% regulated CO2 reduction quantified. See Energy Statement; ES Chapter 6.	-	Planning condition (energy strategy).
PV panels	Flat roof PV generating c.79,023 kWh/yr (SAP10.2).	Maximise on-site renewable electricity generation.	57% of regulated CO2 reduction attributable to renewable sources.	SAP10.2 calculation. See Energy Statement.	-	Approved roof plans; energy condition.
75% regulated CO2 reduction	Be Lean (18%) + Be Green (57%) strategy.	Exceed London Plan minimum 35% target.	Exemplary regulated carbon performance substantially exceeding policy requirements.	Part L modelling. See Energy Statement.	-	Energy condition; Be Seen monitoring.
Smart waste management	Underground / iceberg bins; hiab collection.	Reduce collection vehicle visits and idling within the site.	Fewer on-site emissions from waste collection vehicles.	-	Servicing design review. See DAS; Delivery and Servicing Strategy.	Conditioned Waste Management Strategy
C. Transport emissions						
Low car parking (0.33 ratio)	151 spaces for 463 units. Below London Plan (T4.1) and LBB Local Plan maximums.	Reduce private car ownership and associated vehicle trips.	Fewer vehicle trips and lower tailpipe emissions.	Trip generation analysis in HSTA. See HSTA; Planning Statement.	Pre-application consultation with GLA and TfL confirmed acceptability of low parking ratio.	Approved plans; S106 agreement.
856 cycle parking spaces	843 long-stay + 13 short-stay. 42 adaptive spaces. LCDS compliant.	Encourage cycling as primary transport mode.	Modal shift from car to cycle. Provision exceeds London Plan Policy T5 minimums.	London Plan T5 compliance assessment. See HSTA; DAS.	-	Approved plans; planning condition.
EV charging (20% active / 80% passive)	20% active EV charging from first occupation; 80% passive ducting for future activation.	Support transition to zero-emission vehicles.	Zero tailpipe emissions from EV users. Infrastructure ready for full fleet transition.	EV provision count and specification. See HSTA; DAS.	-	Planning condition.

Measure	Summary of the measure	Reason for undertaking measure	Expected benefits	Assessment methods		How this measure will be secured
				Quantitative reporting	Qualitative reporting	
Car club (2 spaces)	Two dedicated car club spaces at ground level.	Reduce private car ownership.	Fewer privately owned vehicles; access to shared low/zero-emission fleet.	-	Transport planning assessment. See HSTA.	S106 obligation.
Travel Plan	Modal shift targets; annual monitoring; review and remedial mechanisms.	Encourage sustainable travel behaviour and reduce car mode share.	Reduced car trips over time. Trigger review if targets not met.	Modal split targets and monitoring methodology. See Travel Plan; HSTA.	Travel Plan Coordinator role and annual survey methodology. See Travel Plan.	S106 obligation; monitoring condition.
Healthy Streets design	Pedestrian and cycle priority; wide clear pavements; legible routes.	Make active travel more attractive than driving.	Improved street-level environment for pedestrians and cyclists.	-	Healthy Streets assessment. See HSTA; DAS.	Approved drawings/ Planning Permission; HSTA
Construction logistics management	OCLP submitted with application; detailed CLP secured by pre-commencement condition.	Control construction traffic, dust and emissions.	Minimised construction-phase air quality impacts at nearby sensitive receptors.	-	AQE Construction Dust Risk Assessment (Appendix A). OCLP (Lime Transport). See OCLP; AQE Appendix A.	Pre-commencement condition (CLP and CEMP).
D. Innovation and futureproofing						
Future-proofed all-electric energy system	No combustion systems to retrofit. Grid decarbonisation delivers progressive improvement.	Ensure the development's air quality performance improves over time.	Reducing carbon intensity as the national grid continues to decarbonise. No future retrofitting required.	-	Energy strategy review. See Energy Statement.	Energy Strategy condition
Passive EV infrastructure (80%)	Ducting and capacity for future activation of remaining parking spaces.	Accommodate accelerating EV uptake without disruptive retrofitting.	Development ready for full EV fleet transition.	Infrastructure specification and count. See HSTA.	-	Planning condition.
Ecological enhancement and maturing landscape	RHS Pollinator-Friendly species throughout. Riparian margins; wildflower meadows. BNG compliance via dedicated ecology documents.	Long-term air quality and ecological co-benefits from maturing vegetation.	Increasing particulate deposition and gaseous pollutant uptake as planting establishes and matures over time.	-	Ecological assessment and landscape design review. See PEA; BNG Report; Planting Specification.	LEMP condition; BNG via S106 / condition.
Be Seen energy monitoring	Post-occupation energy monitoring and reporting via GLA Be Seen portal.	Verify actual energy performance against design-stage predictions.	Accountability and adaptive management. Ongoing verification of zero-combustion strategy.	Be Seen LPG (March 2022) methodology. Monitored data at 1-year and 3-year intervals. See Energy Statement.	-	Planning condition (Be Seen).

4. Implementation and Monitoring

4.1 Consultation

The AQP approach has been informed by consultation with the GLA (strategic briefing March 2025; formal pre-application May 2025), TfL (scoping meeting April 2025), LBB Planning Officers, LBB Highways Officers, and LBB Ecology Officers, as detailed in Section 1.3 above. The development was also reviewed by the Barnet Quality Review Panel (October 2024), which supported the redevelopment and noted the ambition for outdoor spaces and landscape quality.

4.2 Implementation Plan

The following table summarises how each category of AQP measure will be secured and the timing of implementation.

Measure Category	Securing Mechanism	Timing
Site layout and design	Approved drawings/ planning permission	Embedded in planning permission
Energy strategy (all-electric, ASHP, PV)	Planning condition	Pre-commencement / prior to occupation
Ventilation (MVHR + hybrid cooling)	Planning condition (building services)	Prior to occupation
Landscaping and green infrastructure	Approved landscape drawings; LEMP conditions	Prior to occupation and ongoing post-occupation
Car parking (0.33 ratio)	Approved plans; S106	As built
Cycle parking (856 spaces)	Approved plans; planning condition	Prior to occupation
EV charging	Planning condition	Prior to occupation
Car club (2 spaces)	S106 obligation	Prior to first occupation
Travel Plan	S106 obligation; monitoring condition	Prior to occupation; annual review
Construction logistics (CLP/CEMP)	Pre-commencement condition	Prior to commencement
Waste management (iceberg bins)	Waste management condition	Prior to occupation
Be Seen energy monitoring	Planning condition with reporting obligation	Post-occupation; ongoing reporting
BNG off-site credits	S106 obligation / condition	Prior to determination / commencement

4.3 Monitoring Plan

The following monitoring mechanisms will ensure the AQP measures are delivered and maintained:

Travel Plan Monitoring: The Travel Plan Coordinator (appointed by the Building Operator / Estate Management Company) will conduct annual resident travel surveys for a minimum of five years post-first-occupation. Results will be reported to LBB and TfL. If car mode share exceeds the target set in the Travel Plan, a trigger review will be initiated and remedial measures implemented (e.g. additional cycle incentives, enhanced car club promotion, or revised parking management). Monitoring contributions are secured via the S106 agreement.

Be Seen Energy Monitoring: The M&E / Facilities Management team will carry out post-occupation energy monitoring and reporting in accordance with the GLA's Be Seen LPG. Actual energy consumption and

regulated CO₂ emissions will be compared against design-stage predictions at 1-year and 3-year intervals. Results will be reported to the GLA via the Be Seen portal. Secured by planning condition.

MVHR Maintenance and Filter Replacement: The M&E / FM team will be responsible for the commissioning, ongoing maintenance, and regular filter replacement of MVHR units in accordance with manufacturer specifications. The development is Build To Rent ensuring that the Management Company will have access to units to implement regular maintenance. Residents will be provided with guidance on system operation.

Construction Environmental Management: The Principal Contractor's Environmental Manager will be responsible for implementing the detailed CEMP and CLP, both secured by pre-commencement condition. Dust monitoring will be conducted at frequencies determined by the CEMP, with real-time monitoring at the site boundary during high-risk activities. A complaints log will be maintained and action thresholds defined for dust suppression escalation, in accordance with the GLA SPG on The Control of Dust and Emissions During Construction and Demolition (2014) and the AQE Construction Dust Risk Assessment (AQE Appendix A).

Landscape and Ecology Management: A landscape management company (appointed by the Building Operator) will implement the LEMP. This includes annual review of all planted areas and green/blue roofs; replacement of any failed trees or planting within the next available planting season; scheduled maintenance of wildflower meadows, native hedgerows, and riparian margins; and roof substrate and drainage inspection. Annual reporting will confirm the ongoing condition of green infrastructure and any remedial actions taken.

Car Club and EV Charging Review: The Estate Management Company will review car club uptake and EV charging demand at annual intervals following first occupation. Car club usage data will inform the Travel Plan review process.

5. Summary and Conclusions

This Air Quality Positive Statement demonstrates that the Proposed Development at Stoney Wood Quarter has been designed holistically to maximise benefits to air quality and minimise exposure to air pollution, in accordance with London Plan Policy SI 1 and the GLA's Air Quality Positive London Plan Guidance (February 2023).

The development delivers significant air quality benefits across all four themes of the AQP framework:

Better design and reducing exposure: The site layout separates vehicles from sensitive uses, locates play areas and public realm within the site interior, and provides extensive green infrastructure achieving a UGF of 0.5 and an uplift in tree numbers. All 463 units benefit from MVHR.

Building emissions: The all-electric energy strategy eliminates all on-site combustion, resulting in zero direct on-site emissions of NO_x and PM from heating or hot water, with a 75% regulated CO₂ reduction over Part L 2021 as demonstrated in the Energy Statement.

Transport emissions: A car parking ratio of 0.33, 856 cycle spaces, EV charging, car club provision, and a monitored Travel Plan collectively deliver substantial reductions in transport-related emissions.

Innovation and futureproofing: The all-electric system is inherently future-proofed, passive EV infrastructure accommodates accelerating uptake, and native ecological planting provides increasing air quality benefits as it matures. Be Seen monitoring provides ongoing accountability.

The Air Quality Assessment (AQE, November 2025) confirms that baseline pollutant concentrations are below objective levels and that air quality does not constrain the development.

Measures are secured through approved plans, planning conditions, and S106 obligations, with monitoring mechanisms ensuring long-term delivery. The development will contribute positively to the London Borough of Barnet's AQMA objectives and the Mayor's wider ambition for clean air in London.

Appendix A: Schedule of Technical Assessments

The GLA Air Quality Positive guidance (paragraph 4.3.7) requires a glossary of the technical evaluations and assessments that have informed the adopted measures. The following table identifies each key technical document, its scope, and the AQP themes it has informed.

Document	Relevance	AQP Theme(s) Informed
Air Quality Assessment (AQE, Nov 2025) ES Appendix 6.1	Baseline pollutant concentrations (Defra mapping, monitoring data). Dispersion modelling of NO ₂ , PM ₁₀ , PM _{2.5} at existing receptors for baseline (2022) and future year (2029). Construction Dust Risk Assessment (Appendix A). Air Quality Neutral assessment (Appendix B). Model verification (Appendix D).	A: Better Design and Reducing Exposure B: Building Emissions C: Transport Emissions
Energy and Sustainability Statement (Irvineering)	All-electric energy strategy. ASHP specification and SCoP. PV generation. Part L modelling (75% CO ₂ reduction). Be Lean / Be Green / Be Seen hierarchy. Overheating assessment. Heat network review.	B: Building Emissions D: Innovation and Futureproofing
Healthy Streets Transport Assessment (Lime Transport, Nov 2025)	Trip generation. Parking strategy (0.33 ratio). Cycle parking (856 spaces). EV charging. Car club. Healthy Streets indicators. Modal split analysis. Impact on local highway network.	C: Transport Emissions A: Better Design and Reducing Exposure
Travel Plan (Lime Transport, Nov 2025)	Modal shift targets. Monitoring methodology. Remedial action triggers. Travel Plan Coordinator role.	C: Transport Emissions D: Innovation and Futureproofing
Outline Construction Logistics Plan (Lime Transport, Nov 2025)	Construction traffic routing and management. Vehicle numbers. Phasing. Delivery scheduling.	C: Transport Emissions
Design and Access Statement (London Placemaking, Nov 2025)	Site layout rationale. Building orientation and massing. Public realm strategy. Play provision. Landscape design. Vehicle/pedestrian separation.	A: Better Design and Reducing Exposure
Urban Greening Factor Assessment (London Placemaking)	UGF calculation (0.5 achieved vs 0.4 target). Breakdown of surface types. Green/blue roof areas.	A: Better Design and Reducing Exposure D: Innovation and Futureproofing
Soft Landscaping Specification and Illustrated Planting Schedule (London Placemaking)	Species selection (all RHS Pollinator-Friendly). Planting densities. Green/blue roof build-up. Native hedge, wildflower meadow, and riparian margin specifications. Tree retention and new planting.	A: Better Design and Reducing Exposure D: Innovation and Futureproofing
Draft LEMP (London Placemaking)	Long-term management of green infrastructure. Maintenance schedules. Tree replacement. Roof maintenance.	D: Innovation and Futureproofing
Preliminary Ecological Appraisal (Phlorum)	Baseline ecology. Protected species. SINC interface. Habitat assessment.	A: Better Design and Reducing Exposure
BNG Assessment (Phlorum Ltd)	Biodiversity baseline and post-development assessment. Off-site credit requirements.	D: Innovation and Futureproofing
Arboricultural Impact Assessment (Quaife Woodlands)	Tree survey. Retention plan (71 retained). Category A/B/C classification. Root Protection Areas.	A: Better Design and Reducing Exposure

TECHNICAL MEMORANDUM

Project: Stoney Wood Quarter, Mill Hill, London
Subject: Response to LBB Environmental Health and Planning Comments
To: Alex Kuropatwa
Written By: Jacob Tyler-White MIOA **Checked By:** Oliver Packman MIOA
Memo Ref.: 28113.TM.01 RevA **Date:** 15 May 2026

1.0 INTRODUCTION

KP Acoustics Ltd has been commissioned to provide formal technical clarification regarding the Noise Impact Assessment (NIA) report (Ref: 28113.NIA.01 Rev.E). This note specifically addresses feedback from the London Borough of Barnet (LBB) Environmental Health (EH) team and the Planning Officer regarding the suitability of the noise survey data.

The following sections provide a detailed response to the specific concerns raised by the local authority, incorporating direct quotes from their feedback to ensure all points are addressed comprehensively.

2.0 INTERNAL NOISE LEVEL CRITERIA

British Standard BS8233:2014 *Sound Insulation and Noise Reduction for Buildings* provides recommended internal ambient noise levels for residential dwellings. The recommended criteria are reproduced in Table 2.1 below.

Activity	Location	Maximum Noise Criteria	
		07:00 to 23:00	23:00 to 07:00
Resting	Living Rooms	35 dBA	-
Dining	Dining Room/area	40 dBA	-
Sleeping (daytime resting)	Bedrooms	35 dBA	30 dBA

Table 2.1 BS8233 recommended internal background noise levels

It should be noted that the above internal noise level criteria are not intended to apply during “purge ventilation” conditions, as defined within Approved Document F of the Building Regulations, since this mode of ventilation would only occur occasionally (for example, to remove excess heat, odours, or smoke from cooking). However, the recommended internal noise levels should be achieved under normal background ventilation conditions, whether through passive or mechanical means.

In addition, the WHO Guidelines for Community Noise (1999) recommend that individual night-time noise events within bedrooms should not regularly exceed 45 dB L_{Amax} more than 10 to 15 times per night.

Accordingly, the external building fabric, glazing systems and ventilation strategy have been designed to ensure compliance with the above guidance.

3.0 RESPONSE TO LBB ENVIRONMENTAL HEALTH AND PLANNING COMMENTS

The following comments were received from the London Borough of Barnet (LBB) Environmental Health team. Responses to each point are provided alongside the relevant comments below.

3.1 Duration of Measurements and Reliability of Dataset

Comment from LBB Environmental Health:

"Having reviewed the submitted documents, I am not satisfied with the noise survey data from Location-A (described as being at the nearest position to the M1) where only a single short term attended measurement was taken on 16/11/2024 between 11:45-12:00am (15 minutes duration)."

Response:

The attended measurement at Position A was intentionally limited to a short-term attended exercise as this location comprised an open and easily accessible area adjacent to the western boundary of the site. Unlike Positions 1 and 2, which were located within a secure compound suitable for unattended deployment, Position A was not considered appropriate for unattended long-term monitoring equipment due to security and access constraints.

However, Position A was not assessed in isolation. Continuous long-term unattended monitoring was also undertaken at Positions 1 and 2 between Thursday 12 December 2024 and Monday 16 December 2024, providing a robust dataset covering multiple days, weekday and weekend conditions and full diurnal cycles.

The unattended monitoring durations were as follows:

- Position 1: 92 hours
- Position 2: 91 hours 15 minutes.

Full time-history data showing maximum noise levels (L_{AFmax}), ambient noise levels ($L_{Aeq,T}$) and background noise levels (L_{AF90}) are enclosed within Appendix TH1 and TH2. The attended

measurement at Position A was undertaken during a representative daytime period under normal motorway operating conditions.

The purpose of the attended measurement at Position A was to establish the relative difference in noise level between the closest practical position to the M1 motorway and the long-term unattended monitoring locations, rather than to independently characterise temporal variation across the site.

The long-term unattended measurements allow the attended measurement at Position A to be calibrated against concurrent measurements at Position 1, enabling representative daytime and night-time noise levels to be derived over the full survey duration. This approach is consistent with the representative measurement principles contained within ISO 1996-2:2017, particularly in situations where site access or security constraints prevent unattended monitoring at the closest façade location.

Importantly, the dominant noise source affecting both Position 1 and Position A was steady-state motorway traffic associated with the M1. As the same dominant source governed the noise climate at both locations, the relative difference in measured noise level between the positions remained consistent. This therefore allowed representative façade noise exposure at Position A to be robustly derived from the long-term unattended monitoring data.

Accordingly, the assessment is not reliant upon a single 15-minute attended measurement in isolation, but instead utilises a combination of long-term unattended monitoring and a short-term attended measurement to derive representative worst-case façade noise levels across the site.

3.2 Position of Measurement Location A

Comment from LBB Environmental Health:

Firstly: the site measurement position for location A, shown in Figure 2.1 (page 2 of the Noise Impact Assessment (NIA) by 'KP Acoustics', dated 28/03/2025) is not near to the site boundary and not at the nearest position to the M1.

Comment from Planner:

The EH Team's first concern is that the noise measurement for Location A was taken from a point that is neither close to the site boundary nor the nearest part of the site to the M1. Although this position may give a general indication of noise levels in that part of the site, the EH Team advise that it is not suitable for assessing the constant traffic noise from the M1 that would affect Blocks A and B of the proposed development.

Response:

The following table and figure present the environmental noise survey measurement positions referred to throughout this technical memorandum.

Icon	Location Description
1	The microphone was installed on a tripod approximately 1.5m above ground level to the southwest of the site. The microphone was positioned in free-field conditions, approximately 1.5 metres from the nearest reflective surface.
2	The microphone was installed on a tripod approximately 1.5m above ground level to the east of the site. The microphone was positioned in free-field conditions, approximately 1.5 metres from the nearest reflective surface.
A	The microphone was installed on a tripod atop a mound to the northwest of the site, at the closest practical position to the M1. The microphone was positioned in free-field conditions, approximately 1.5 metres from the nearest reflective surface.

Table 3.1 Measurement positions and descriptions



Figure 3.1 Site measurement positions (Image Source: Google maps)

Position A was located approximately 120 metres from the M1 motorway, whilst the nearest proposed façades are located approximately 90 metres to 100 metres from the motorway.

The figure demonstrates that Position A was located along the north-western edge of the site boundary at the closest practical and accessible location to the M1 motorway within the application site.

The measurement position was selected to achieve suitable free-field measurement conditions in accordance with ISO 1996-2:2017, whilst also accounting for site access and security constraints associated with unattended monitoring equipment.

The relative difference in distance between Position A and the most onerous façades is limited (approximately 20-30 metres). Accordingly, standard distance corrections can be applied in order to derive representative worst-case façade noise levels (refer Section 3.3).

Furthermore, given that the dominant noise source across this part of the site is steady-state motorway traffic from the M1, the noise climate across the western boundary of the site is considered relatively spatially uniform.

3.3 Representativeness of the Measurement Data

Comment from LBB Environmental Health:

Whilst it may be argued that the measurement location will be representative of the noise level 'across' this area of the site, when considering the potential impact of steady-state noise from the M1 on blocks A & B of the proposed development, the potential impact is too significant to accept measurements taken at this location for such a short duration.

Secondly: the duration of the measurement at location A (one measurement of 15-minute duration) is woefully inadequate and will not be accepted as representative of the noise climate in this area of the site nearest to the M1 Motorway.

Comment from Planner:

The second concern is that the 15 minute noise measurement taken at Location A (as identified in the report) is far too short and cannot be treated as a reliable indication of noise levels in part of the site that is closest to the M1 motorway.

Response:

The measured survey results are summarised below. Table 3.2 presents the ambient noise levels measured over the full unattended survey duration at Positions 1 and 2.

Position	Survey Duration	Daytime $L_{Aeq,T}$	Night-time $L_{Aeq,T}$
1	12/12/2024 16:01 to 16/12/2024 12:01	60 dBA	57 dBA
2	12/12/2024 16:12 to 16/12/2024 11:27	56 dBA	51 dBA

Table 3.2 Long-term unattended monitoring results

The attended measurement undertaken at Position A was not intended to independently characterise temporal variation across the site. Instead, the purpose of the attended

measurement was to establish the relative difference in noise level between the closest practical position to the M1 motorway and the long-term unattended monitoring locations.

Table 3.3 below compares the attended measurement undertaken at Position A against the concurrent measurement recorded at Position 1 during the same representative daytime period.

Position	Measurement Period	Measured $L_{Aeq,T}$
1	16/12/2024 11:45 to 12:00	62
A	16/12/2024 11:45 to 12:00	64

Table 3.3 Comparison Between Position 1 and Position A

The attended measurement undertaken at Position A recorded a noise level 2 dB higher than Position 1 during the same measurement period. This differential was subsequently applied to the long-term unattended monitoring data at Position 1 in order to derive representative daytime and night-time noise levels at Position A, as follows:

- Daytime: $60 + (2) = 62$ dBA $L_{eq,T}$
- Night-time: $57 + (2) = 59$ dBA $L_{eq,T}$

The next step is to account for the reduced setback distance between Position A and the nearest worst-case affected façades.

Description	Derive Noise Level at Worst-Case Affected Façades	
	Façade at 100m from M1	Façade at 90m from M1
Derived noise level at Position A (Daytime / Night-time)	62 / 59 dBA	62 / 59 dBA
Correction for reduced setback distance to M1*	+0.8 dB	+1.2 dB
Derived worst-case façade level (Daytime / Night-time)	63 / 60 dBA	63 / 60 dBA

Table 3.4 Deriving worst case façade noise levels

* A line-source propagation correction of $10\log(r_1/r_2)$ has been applied to account for the reduced setback distance between Position A and the nearest proposed façades relative to the M1 motorway.

The calculations above demonstrate that, even when applying conservative corrections to derive worst-case façade exposure along the western boundary façades, the resultant façade noise levels are approximately 63 dBA daytime and 60 dBA night-time.

Furthermore, given that the dominant noise source across this part of the site is steady-state motorway traffic from the M1, the noise climate across the western boundary of the site is considered relatively spatially uniform.

These calibrated façade noise levels were subsequently used to derive the glazing and ventilation specifications for the development. Please note that the full octave-band calculations used to derive the required glazing and trickle ventilation specifications are enclosed within Appendix B(1-3).

The calculations demonstrate that the predicted internal noise levels at the worst-case affected façades (refer Appendix B(3) - Glazing Type 3) remain compliant with the BS8233:2014 recommended internal ambient noise criteria of:

- 35 dBA $L_{Aeq,T}$ during daytime periods within living rooms and bedrooms
- 30 dBA $L_{Aeq,T}$ during night-time periods within bedrooms.

The calculations also demonstrate compliance with the WHO Guidelines for Community Noise (1999), which recommend that individual night-time noise events should not regularly exceed 45 dBA L_{max} more than 10-15 times per night.

Accordingly, the assessment demonstrates that acceptable internal residential noise conditions can be achieved through the specified glazing and ventilation measures across the development, including the worst-case façades adjacent to the M1 motorway.

The required glazing and trickle ventilation specifications are summarised in the following table.

Glazing Configuration	Sound Reduction Indices (dB) at Octave Band Centre Frequency (Hz)						$R_w(C;C_{tr})$, dB	Trickle Vents dB $D_{n,e,w}$
	125	250	500	1k	2k	4k		
Glazing Type 1 (BLUE)	20	21	29	38	34	45	32 (-1;-4)	39
Glazing Type 2 (GREEN)	24	20	25	35	38	35	31 (-1;-4)	31
Glazing Type 3 (RED)	20	25	29	38	34	45	33 (-1;-4)	39

Table 3.5 Required glazing performance



Figure 3.2 Glazing layouts

3.4 Additional Measurements Requested by EH

Comment from LBB Environmental Health:

"We will require additional noise measurements to be taken at the boundary to the West of the site (and location-A). If only attended measurements can be provided (possibly for security reasons) we will require a number of measurements that are taken throughout the day and include both early morning and early evening rush-hour periods, with additional measurements take throughout the day overall."

Comment from Planner:

"As such, they have advised that additional noise measurements would need to be taken at the western site boundary (and Location A) and that if the method of recording can only be undertaken in person (as opposed to an unmanned survey) then several individual measurements would be required during the early morning and early evening rush hour periods, along with further measurements through the daytime, so that the typical noise conditions of the site can be captured."

Response:

The Environmental Health team have requested additional attended measurements at Position A in order to demonstrate that the short-term measurement is representative of noise conditions throughout the day, including peak traffic periods associated with the M1 motorway.

However, the assessment methodology already incorporates long-term unattended monitoring undertaken over periods exceeding 91 hours at Positions 1 and 2. These measurements captured weekday and weekend conditions, including daytime, evening, night-time and rush-hour traffic periods.

The attended measurement undertaken at Position A was not intended to represent the full temporal variation at the site in isolation. Instead, it was undertaken to establish the relative difference in noise level between the closest practical position to the M1 motorway and the long-term unattended monitoring locations.

By comparing the attended measurement at Position A against concurrent measurements at Position 1, it was possible to establish a representative correction factor between the locations. This correction factor was subsequently applied to the full long-term unattended dataset in order to derive representative daytime and night-time noise levels at Position A.

Accordingly, the long-term unattended measurements already capture the temporal variation requested by the Environmental Health team, including peak traffic periods and representative daily fluctuations associated with the M1 motorway.

Accordingly, the additional attended measurements requested would not materially alter the conclusions of the assessment, as the calibrated long-term unattended dataset already provides a representative and robust assessment of worst-case façade noise exposure across the development site.

3.5 Alleged Discrepancies Between Table 2.1 and Figure 2.1

Comment from Planner:

“Aside from concerns about the methodology, the EH Team have noted discrepancies within the report in respect of the measurement positions noted in Table 2.1 and Figure 2.1 on page two of the assessment. Along with addressing the above methodology concerns, they require that these discrepancies be corrected and clarified.”

Response:

No discrepancies have been identified between Table 2.1 and Figure 2.1 of the 28113.NIA.01 RevE Noise Impact Assessment report.

Table 2.1 defines the survey locations as follows:

- Position 1: southwest of the site
- Position 2: east of the site

- Position A: northwest of the site at the closest practical position to the M1 motorway.

Figure 2.1 spatially corroborates these positions and demonstrates the relative relationship between the measurement locations and the surrounding site context.

At present, no specific discrepancy between the table and figure has been identified within the consultation comments received from the Local Planning Authority or Environmental Health team.

Nevertheless, the Figure 3.1 presented within this technical memorandum has been overlaid with the proposed site layout in order to provide further clarity regarding the relationship between the survey positions and the proposed development.

4.0 CONCLUSION

This technical memorandum has been prepared in response to comments received from the London Borough of Barnet Environmental Health team and Planning Officer regarding the environmental noise survey methodology presented within the 28113.NIA.01 RevE Noise Impact Assessment report.

As demonstrated throughout this memorandum, the assessment was not based solely upon a single 15-minute attended measurement. The survey methodology incorporated over 91 hours of unattended monitoring at Positions 1 and 2, capturing representative daytime, evening, night-time and peak traffic conditions associated with the M1 motorway.

The attended measurement undertaken at Position A was used as a supplementary façade-specific calibration exercise to establish the relative difference in noise level between the closest practical position to the M1 motorway and the long-term unattended monitoring locations.

Importantly, the dominant noise source affecting all monitoring positions was steady-state motorway traffic associated with the M1. Accordingly, the calibrated Position A data provides a representative and robust basis for deriving worst-case façade noise levels along the western boundary of the development site.

The derived façade noise levels were subsequently used to inform the glazing and ventilation strategy for the development. The enclosed calculations demonstrate that the proposed façade design is capable of achieving compliance with BS8233:2014 and WHO internal noise guidance, including at the façades closest to the M1 motorway.

Accordingly, it is considered that the submitted Noise Impact Assessment, together with the supplementary clarification provided within this memorandum, provides a robust basis upon which the Local Planning Authority can reach an informed planning judgement regarding environmental noise impacts associated with the proposed development.

Any remaining detailed acoustic design matters can be appropriately secured through suitably worded planning conditions during the detailed design stage.

On the basis of the long-term time-history data, the attended Position A measurement, the distance correction and the façade calculations appended to this Technical Memorandum, further attended measurements at Position A would not materially alter the required glazing and ventilation specification or the overall planning conclusion. The submitted information provides a robust basis for assessing the M1-exposed façades and demonstrates that acceptable internal residential noise conditions can be achieved through the specified façade, glazing and ventilation measures.

A summary of the comments raised and the corresponding responses provided within this memorandum is presented in Table 4.1 below.

Comment	Response	Evidence / Action
Position A not at boundary / not nearest to M1.	Position A was located at the closest practical and accessible position to the M1 within the site boundary. The difference in setback distance between Position A and the nearest façades is limited.	Figure 3.1 overlaid with proposed site layout. Distance corrections applied in Section 3.3.
15-minute attended measurement inadequate.	The assessment was not based solely on the attended measurement. Long-term unattended monitoring exceeding 91 hours was undertaken at Positions 1 and 2.	Long-term monitoring data and time histories enclosed within Appendix TH1 and TH2.
Require additional measurements at western boundary.	The attended measurement at Position A was calibrated against long-term unattended monitoring in order to derive representative worst-case façade levels.	Section 3.3 calibration methodology and façade derivation calculations.

Comment	Response	Evidence / Action
Require rush-hour and daytime measurements.	Long-term unattended monitoring captured daytime, evening, night-time, weekday, weekend and peak traffic conditions associated with the M1 motorway.	Continuous monitoring over periods exceeding 91 hours at Positions 1 and 2.
Require results and time history.	Full time-history data showing $L_{Aeq,T}$, L_{AF10} , L_{AF90} and L_{AFmax} measurements have been provided.	Appendix TH1 and TH2 enclosed.
Alleged discrepancy between Table 2.1 and Figure 2.1.	No discrepancies identified between the measurement location descriptions and the survey figure. Additional overlay plan provided for clarification.	Figure 3.1 within this memorandum.

Table 4.1 Summary of comments and responses

GENERAL ACOUSTIC TERMINOLOGY

Decibel scale - dB

In practice, when sound intensity or sound pressure is measured, a logarithmic scale is used in which the unit is the 'decibel', dB. This is derived from the human auditory system, where the dynamic range of human hearing is so large, in the order of 10^{13} units, that only a logarithmic scale is the sensible solution for displaying such a range.

Decibel scale, 'A' weighted - dB(A)

The human ear is less sensitive at frequency extremes, below 125Hz and above 16Khz. A sound level meter models the ears variable sensitivity to sound at different frequencies. This is achieved by building a filter into the Sound Level Meter with a similar frequency response to that of the ear, an A-weighted filter where the unit is dB(A).

L_{eq}

The sound from noise sources often fluctuates widely during a given period of time. An average value can be measured, the equivalent sound pressure level L_{eq} . The L_{eq} is the equivalent sound level which would deliver the same sound energy as the actual fluctuating sound measured in the same time period.

L_{10}

This is the level exceeded for no more than 10% of the time. This parameter is often used as a "not to exceed" criterion for noise.

L_{90}

This is the level exceeded for no more than 90% of the time. This parameter is often used as a descriptor of "background noise" for environmental impact studies.

L_{max}

This is the maximum sound pressure level that has been measured over a period.

Octave Bands

In order to completely determine the composition of a sound it is necessary to determine the sound level at each frequency individually. Usually, values are stated in octave bands. The audible frequency region is divided into 11 such octave bands whose centre frequencies are defined in accordance with international standards. These centre frequencies are: 16, 31.5, 63, 125, 250, 500, 1000, 2000, 4000, 8000 and 16000 Hertz.

Environmental noise terms are defined in BS7445, *Description and Measurement of Environmental Noise*.

APPLIED ACOUSTIC TERMINOLOGY

Addition of noise from several sources

Noise from different sound sources combines to produce a sound level higher than that from any individual source. Two equally intense sound sources operating together produce a sound level which is 3dB higher than a single source and 4 sources produce a 6dB higher sound level.

Attenuation by distance

Sound which propagates from a point source in free air attenuates by 6dB for each doubling of distance from the noise source. Sound energy from line sources (e.g. stream of cars) drops off by 3dB for each doubling of distance.

Subjective impression of noise

Hearing perception is highly individualised. Sensitivity to noise also depends on frequency content, time of occurrence, duration of sound and psychological factors such as emotion and expectations. The following table is a guide to explain increases or decreases in sound levels for many scenarios.

Change in sound level (dB)	Change in perceived loudness
1	Imperceptible
3	Just barely perceptible
6	Clearly noticeable
10	About twice as loud

Transmission path(s)

The transmission path is the path the sound takes from the source to the receiver. Where multiple paths exist in parallel, the reduction in each path should be calculated and summed at the receiving point. Outdoor barriers can block transmission paths, for example traffic noise. The effectiveness of barriers is dependent on factors such as its distance from the noise source and the receiver, its height and construction.

Ground-borne vibration

In addition to airborne noise levels caused by transportation, construction, and industrial sources there is also the generation of ground-borne vibration to consider. This can lead to structure-borne noise, perceptible vibration, or in rare cases, building damage.

Sound insulation - Absorption within porous materials

Upon encountering a porous material, sound energy is absorbed. Porous materials which are intended to absorb sound are known as absorbents, and usually absorb 50 to 90% of the energy and are frequency dependent. Some are designed to absorb low frequencies, some for high frequencies and more exotic designs being able to absorb very wide ranges of frequencies. The energy is converted into both mechanical movement and heat within the material; both the stiffness and mass of panels affect the sound insulation performance.

APPENDIX B(1)

Stoneywood Quarter

EXTERNAL BUILDING FABRIC CALCULATIONS

GLAZING TYPE 1

British Standard BS8233:2014, Section G.2 - Internal noise level calculation method:		
$L_{eq,2} = L_{eq,ff} + 10 \log_{10} \left(\frac{A_0}{S} 10^{\frac{-D_{n,e}}{10}} + \frac{S_{wi}}{S} 10^{\frac{-R_{wi}}{10}} + \frac{S_{ew}}{S} 10^{\frac{-R_{ew}}{10}} + \frac{S_{rr}}{S} 10^{\frac{-R_{rr}}{10}} \right) + 10 \log_{10} \left(\frac{S}{A} \right) + 3$		
L_{eq,2}	Sound pressure level in a room (dB).	S is the total area in m ² of the elements through which sound enters the room.
L_{eq,ff}	Equivalent continuous free-field sound pressure level outside the room façade.	D_{n,e} is the insulation of the trickle ventilation measured according to BS EN ISO 10140.
A₀	is a reference absorption area of 10m ² and is independent of frequency.	R_{wi} is the sound reduction index SRI of the window.
S_f	is the total façade area in m ² of the room in question.	R_{ew} is the sound reduction index SRI of the external wall.
S_{wi}	is the area in m ² of the windows of the room.	R_{rr} is the sound reduction index SRI of the roof/ceiling.
S_{ew}	is the area in m ² of the external wall of the room.	A is the equivalent absorption area of receiving room being considered.
S_{rr}	is the area in m ² of the ceiling of the room.	

Description	Measured External Free-Field Noise Levels (dB)						dBA
	125	250	500	1k	2k	4k	
Daytime Ambient Noise Level (Leq,T)	53	52	55	59	52	39	60
Night-Time Ambient Noise Level (Leq,T)	49	49	52	55	48	37	57
15th Highest Night-time Lmax	64	64	67	69	61	49	71

Room Properties		Sound reduction index of elements (dB) at octave band centre frequency (Hz)						Overall (dB)	
		125	250	500	1k	2k	4k		
Façade width (m)	3	41	43	48	50	55	55	51(-1;-3)	Rw(C; Ctr)
Room height (m)	2.5	20	21	29	38	34	45	32(-1;-4)	Rw(C; Ctr)
Room depth (m)	2.8	35	34	45	38	49	49	39	Dn,e,w
Window area (m ²)	5.4								
No. of trickle Vents	1								

Predicted Internal Noise Levels (dB)							dBA	Criteria
Description	125	250	500	1k	2k	4k		
Daytime Ambient Noise Level (Leq,T)	37	36	27	26	18	-4	32	35
Night-Time Ambient Noise Level (Leq,T)	34	32	25	23	14	-6	28	30
15th Highest Night-time Lmax	49	47	40	37	27	6	43	45

APPENDIX B(2)

Stoneywood Quarter

EXTERNAL BUILDING FABRIC CALCULATIONS

GLAZING TYPE 2

British Standard BS8233:2014, Section G.2 - Internal noise level calculation method:			
Leq,2	Sound pressure level in a room (dB).	S	is the total area in m2 of the elements through which sound
Leq,ff	Equivalent continuous free-field sound pressure level outside	Dn,e	is the insulation of the trickle ventilation measured
A0	is a reference absorption area of 10m2 and is independent of	Rwi	is the sound reduction index SRI of the window.
Sf	is the total façade area in m2 of the room in question.	Rew	is the sound reduction index SRI of the external wall.
Swi	is the area in m2 of the windows of the room.	Rrr	is the sound reduction index SRI of the roof/ceiling.
Sew	is the area in m2 of the external wall of the room.	A	is the equivalent absorption area of receiving room being
Srr	is the area in m2 of the ceiling of the room.		

Description	Measured External Free-Field Noise Levels (dB)						dBA
	125	250	500	1k	2k	4k	
Daytime Ambient Noise Level (Leq,T)	53	51	51	54	47	33	56
Night-Time Ambient Noise Level (Leq,T)	49	47	47	49	41	29	51
15th Highest Night-time Lmax	59	55	64	62	52	40	65

Room Properties	
Façade width (m)	3
Room height (m)	2.5
Room depth (m)	2.8
Window area (m2)	5.4
No. of trickle Vents	1

Element	Sound reduction index of elements (dB) at octave band centre frequency (Hz)						Overall (dB)	
	125	250	500	1k	2k	4k		
Non-Glazed	41	43	48	50	55	55	51(-1;-3)	Rw(C; Ctr)
Glazing	24	20	25	35	38	35	31(-1;-4)	Rw(C; Ctr)
Trickle Vents	30	31	31	32	28	28	31	Dn,e,w

Predicted Internal Noise Levels (dB)							dBA	Criteria
Description	125	250	500	1k	2k	4k		
Daytime Ambient Noise Level (Leq,T)	35	36	29	27	21	8	32	35
Night-Time Ambient Noise Level (Leq,T)	31	31	25	21	16	3	28	30
15th Highest Night-time Lmax	41	40	42	35	26	15	41	45

APPENDIX B(3)

Stoneywood Quarter

EXTERNAL BUILDING FABRIC CALCULATIONS

GLAZING TYPE 3

British Standard BS8233:2014, Section G.2 - Internal noise level calculation method:			
Leq,2	Sound pressure level in a room (dB).	S	is the total area in m2 of the elements through which sound
Leq,ff	Equivalent continuous free-field sound pressure level outside	Dn,e	is the insulation of the trickle ventilation measured
A0	is a reference absorption area of 10m2 and is independent of	Rwi	is the sound reduction index SRI of the window.
Sf	is the total façade area in m2 of the room in question.	Rew	is the sound reduction index SRI of the external wall.
Swi	is the area in m2 of the windows of the room.	Rrr	is the sound reduction index SRI of the roof/ceiling.
Sew	is the area in m2 of the external wall of the room.	A	is the equivalent absorption area of receiving room being
Srr	is the area in m2 of the ceiling of the room.		

Description	Measured External Free-Field Noise Levels (dB)						dBA
	125	250	500	1k	2k	4k	
Daytime Ambient Noise Level (Leq,T)	56	55	57	61	54	41	63
Night-Time Ambient Noise Level (Leq,T)	52	51	55	58	50	39	60
15th Highest Night-time Lmax	67	66	70	72	64	51	74

Room Properties	
Façade width (m)	3
Room height (m)	2.5
Room depth (m)	2.8
Window area (m2)	5.4
No. of trickle Vents	1

Element	Sound reduction index of elements (dB) at octave band centre frequency (Hz)						Overall (dB)	
	125	250	500	1k	2k	4k		
Non-Glazed	41	43	48	50	55	55	51(-1;-3)	Rw(C; Ctr)
Glazing	20	25	29	38	34	45	33(-1;-4)	Rw(C; Ctr)
Trickle Vents	35	34	34	38	49	49	39	Dn,e,w

Predicted Internal Noise Levels (dB)							dBA	Criteria
Description	125	250	500	1k	2k	4k		
Daytime Ambient Noise Level (Leq,T)	39	33	32	29	20	-1	34	35
Night-Time Ambient Noise Level (Leq,T)	35	30	29	25	16	-3	30	30
15th Highest Night-time Lmax	50	45	45	39	30	8	45	45

Stoneywood Quarter - Position 1
Environmental Time History
12/12/2024 to 16/12/2024

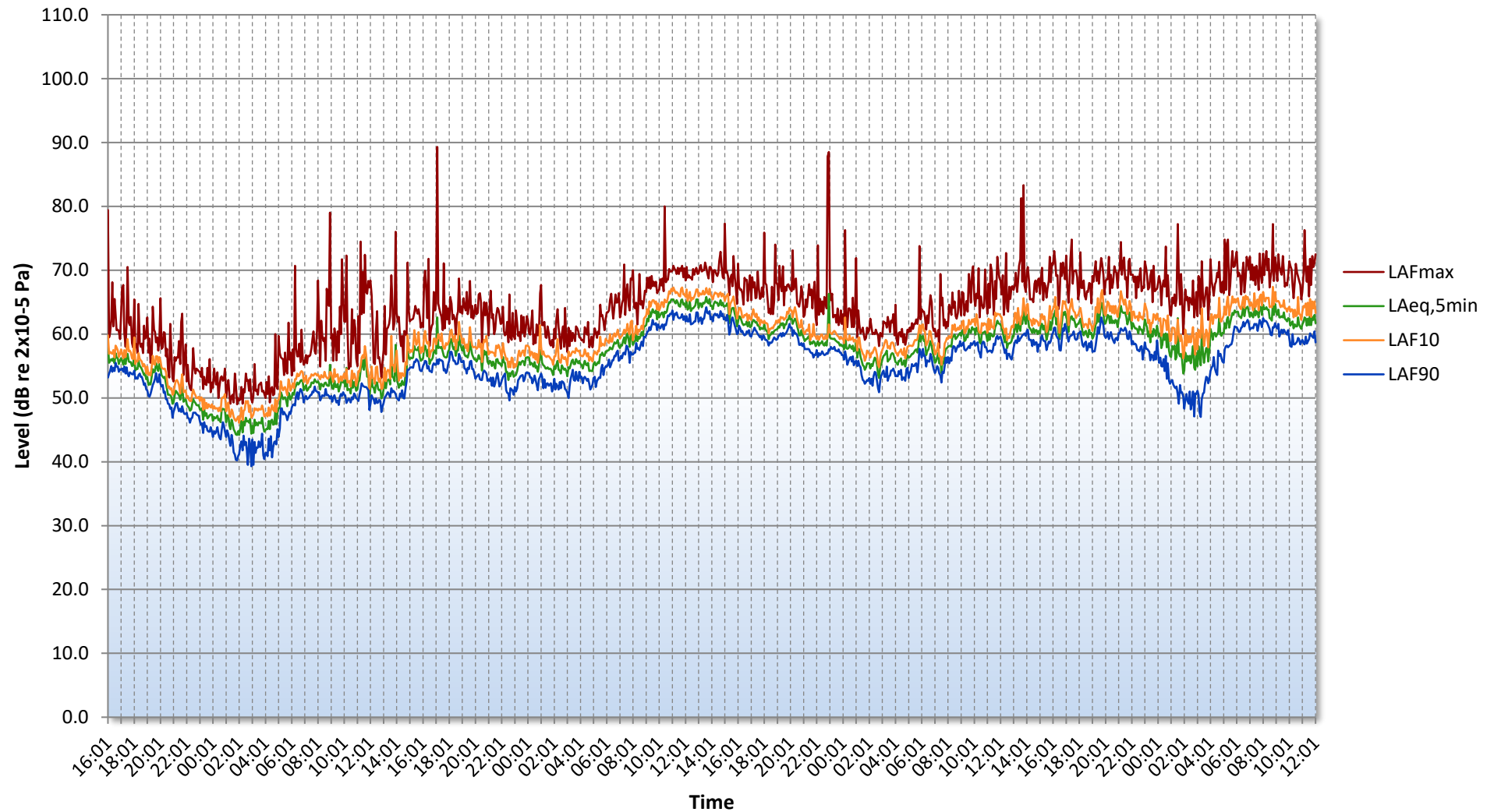


Figure 28113.TH1

Stoney Wood Quarter - Position 2
Environmental Time History
12/12/2024 to 16/12/2024

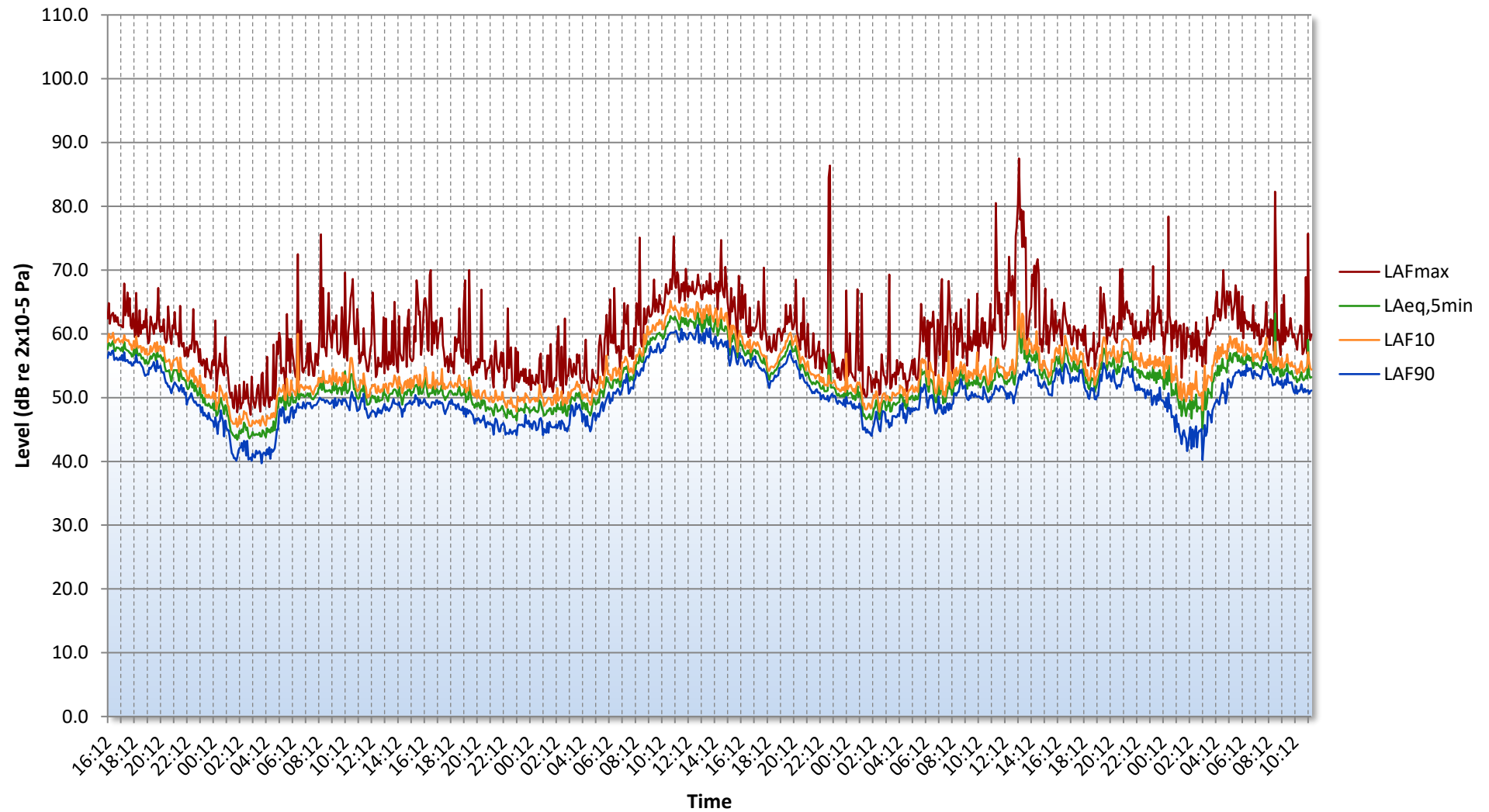


Figure 28113.TH2

MBP- 10491
27 May 2026

STONEY WOOD QUARTER, THE FAIRWAY, LONDON, NW7 3HJ
LPA REFERENCE: 25/2743/FUL
RESPONSE TO GLA WATER MEMO DATED 24 DECEMBER 2025 AND LLFA TECHNICAL RESPONSE DATED 29 JANUARY 2026

We write in response to the comments issued by the Greater London Authority ("GLA") within the Water Memo dated 24 December 2025 and the Lead Local Flood Authority ("LLFA") Technical Response dated 29 January 2026 in relation to the proposed drainage strategy for the above development.

Please find enclosed updated drainage information and supporting calculations addressing the comments raised. A summary response is provided below.

1. Runoff Restriction / Greenfield Runoff Rates

The proposed discharge rates have been set to match the calculated greenfield runoff rates for the 1 in 1, 1 in 30 and 1 in 100 year return period events, including the 1 in 100 year plus 40% climate change event. The strategy has been developed to ensure that post-development runoff does not exceed the corresponding greenfield runoff rates for the equivalent rainfall events.

The drainage strategy has been developed to achieve greenfield-equivalent runoff rates as far as reasonably practicable, having regard to the physical and geological characteristics of the site. The site was historically occupied by buildings and associated hardstanding prior to demolition and clearance. Accordingly, historic brownfield runoff rates associated with the former developed condition would likely have been significantly greater than the equivalent greenfield runoff rates currently proposed as part of the drainage strategy.

The site is now currently undeveloped and drains naturally toward the Deans Brook corridor. Given the underlying London Clay geology, associated poor infiltration characteristics and the apparent absence of surface water sewer infrastructure within the vicinity of the site, it is considered likely that historic surface water runoff from the former development discharged toward the Deans Brook watercourse network.

Infiltration-based drainage techniques have not been proposed due to the underlying London Clay geology, which is recognised as having very low permeability and poor infiltration potential. Typical infiltration rates for London Clay generally range between approximately 1×10^{-6} m/s and 1×10^{-7} m/s, which commonly results in non-compliant BRE365 soakaway performance and excessive drain-down times. Even where infiltration may be achievable at the upper end of this range, soakaway systems typically require substantial plan areas which are not considered appropriate or practical for the proposed development layout.

Accordingly, the proposed drainage strategy represents a controlled and attenuated discharge regime based upon equivalent greenfield runoff rates and will not materially increase downstream flood risk.

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Greenfield runoff calculations prepared using the HR Wallingford UKSuDS greenfield runoff estimation tool are enclosed within the submission.

2. Attenuation Strategy

The proposed attenuation strategy comprises a combination of blue roofs, permeable paving with sub-base attenuation storage and below-ground attenuation tanks. The support noted within the consultee comments is welcomed.

3. SuDS Strategy

The submitted drainage information identifies the proposed SuDS measures, including blue roofs, permeable paving and below-ground attenuation storage. Drawings have been prepared identifying the location and function of the proposed SuDS components within the site.

The green roof build-up includes a drainage and retention layer to provide water retention for the green roof system. The blue roof system includes a proprietary attenuation layer beneath the green roof build-up to provide temporary surface water storage and support passive irrigation of the green roof above.

4. Climate Change Allowances

The hydraulic calculations include the appropriate climate change allowance for the 3.3% AEP event in accordance with current Environment Agency guidance.

5. Watercourse Connection / Wider Connectivity

The proposed surface water discharge is intended to connect to the Deans Brook watercourse network. The site is currently undeveloped following demolition of the former buildings and naturally falls toward the Deans Brook corridor.

The Causeway Flow hydraulic modelling demonstrates that runoff from the site is attenuated and controlled prior to discharge to the receiving watercourse network.

Surface water discharge from the development will be restricted to equivalent greenfield runoff rates, ensuring that post-development runoff rates do not exceed the existing site runoff characteristics and therefore will not materially increase downstream flood risk or adversely impact the existing Deans Brook watercourse network.

The detailed connection arrangement, discharge mechanism and any associated improvement works will be developed and agreed through the separate Ordinary Watercourse Consent ("OWC") process at detailed design stage in consultation with the relevant authority.

At this planning stage, the drainage strategy demonstrates that a viable controlled discharge route is available to the receiving watercourse network. Detailed connection design, final outfall specification and any required localised improvement works will be progressed as part of the detailed drainage design and OWC approval process.

6. Finished Floor Levels, Freeboard and Safe Access / Egress

The submitted Flood Risk Assessment confirms that the proposed development remains safe for its lifetime without increasing flood risk elsewhere.

The hydraulic modelling identifies the 1% AEP plus climate change flood level at 64.7m AOD. Applying the recommended 600mm freeboard results in a target minimum Finished Floor Level ("FFL") of 65.3m AOD. The lowest proposed lower ground floor FFL is 66.149m AOD, providing approximately 1.45m of freeboard above the modelled flood level.

As the lower ground floor remains above the modelled flood level, the development does not constitute a "basement dwelling" for the purposes of flood risk vulnerability classification and is appropriately classified as "More Vulnerable" development.

Residual risk is limited to exceedance of the drainage system during events exceeding the design standard or blockage/maintenance failure. Exceedance routing principles are addressed within the drainage strategy and final proposed levels, exceedance routing and detailed safe access arrangements can be secured through appropriately worded planning conditions at detailed design stage.

7. Exceedance Routing and Drainage Information

Appendix F of the submitted Flood Risk Assessment includes an exceedance routing drawing identifying the proposed overland exceedance flow paths across the site. The submitted strategy demonstrates the exceedance routing principles adopted for the development. Detailed exceedance routing design will be refined and coordinated as part of the detailed drainage design stage.

Drainage drawings and Causeway Flow hydraulic model outputs identifying the proposed drainage layout, including cover levels, invert levels and attenuation features within the network, are enclosed within the submission.

The hydraulic calculations confirm that the proposed attenuation features achieve appropriate drain-down performance, with the maximum recorded half drain-down time being approximately 120 minutes, which is significantly below the 48-hour threshold referenced within the consultee response.

8. Maintenance and Detailed Drainage Design

SuDS maintenance information has been included within the submitted drainage strategy information. It is considered that detailed maintenance arrangements, final proposed levels and detailed drainage coordination can be secured through appropriately worded planning conditions at detailed design stage.

Conclusion

The submitted information demonstrates that the proposed development incorporates an appropriate and sustainable drainage strategy having regard to the physical and geological constraints of the site. The proposed development is considered capable of being safely delivered without increasing flood risk elsewhere and in accordance with the relevant national and local planning policy requirements.

We trust the enclosed information satisfactorily addresses the comments raised by the GLA and LLFA.

Should any further clarification be required, please do not hesitate to contact us.

Yours sincerely,

A handwritten signature in black ink, appearing to read 'S Baker', written in a cursive style.

Simon Baker
Civil Engineer
For MBP

This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance “Rainfall runoff management for developments”, SC030219 (2013), the SuDS Manual C753 (CIRIA, 2015) and the non-statutory standards for SuDS (Defra, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

Project details

Date	03/06/2025
Calculated by	Mint Loader
Reference	10491
Model version	2.0.1

Location

Site name	Stoney Wood Quarter
Site location	Barnet



Site easting	520615
Site northing	193495

Site details

Total site area (ha)	2.191	ha

Greenfield runoff

Method

Method	FEH statistical

FEH statistical

	<u>My value</u>		<u>Map value</u>
SAAR (mm)	683	mm	683
BFIHOST	0.175		
QMed-QBar conversion	1.136		1.136
QMed (l/s)	11.8	l/s	
QBar (FEH statistical) (l/s)	13.4	l/s	

Growth curve factors

	<u>My value</u>		<u>Map value</u>
Hydrological region	6		6
1 year growth factor	0.85		
2 year growth factor	0.88		
10 year growth factor	1.62		
30 year growth factor	2.3		
100 year growth factor	3.19		
200 year growth factor	3.74		

Results

Method	FEH statistical	
Flow rate 1 year (l/s)	11.4	l/s
Flow rate 2 year (l/s)	11.8	l/s
Flow rate 10 years (l/s)	21.8	l/s
Flow rate 30 years (l/s)	30.9	l/s
Flow rate 100 years (l/s)	42.8	l/s
Flow rate 200 years (l/s)	50.2	l/s

Disclaimer

This report was produced using the Greenfield runoff rate estimation tool (2.0.1) developed by HR Wallingford and available at uksuds.com (<https://www.uksuds.com/>). The use of this tool is subject to the UK SuDS terms and conditions and licence agreement, which can both be found at [uksuds.com/terms-conditions](https://www.uksuds.com/terms-conditions) (<https://www.uksuds.com/terms-conditions>). The outputs from this tool have been used to estimate Greenfield runoff rates. The use of these results is the responsibility of the users of this tool. No liability will be accepted by HR Wallingford, the Environment Agency, Centre for Ecology and Hydrology, Wallingford Hydrosolutions or any other organisation for the use of these data in the design or operational characteristics of any drainage scheme.

Design Settings

Rainfall Methodology	FEH-22	Minimum Velocity (m/s)	1.00
Return Period (years)	100	Connection Type	Level Soffits
Additional Flow (%)	40	Minimum Backdrop Height (m)	3.000
CV	0.750	Preferred Cover Depth (m)	0.750
Time of Entry (mins)	5.00	Include Intermediate Ground	✓
Maximum Time of Concentration (mins)	30.00	Enforce best practice design rules	x
Maximum Rainfall (mm/hr)	50.0		

Nodes

Name	Area (ha)	T of E (mins)	Add Inflow (l/s)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
ATT 14.1	0.120	5.00		73.307		120.033	22.831	1.650
MH 14.1				73.307	1200	119.913	11.751	1.801
RFO 01				89.357	150	129.947	12.460	16.800
MH 14.0				73.307	1200	119.406	9.460	1.815
RFO 02				89.357	150	106.460	20.774	16.800
MH 13.0				73.307	1200	102.832	11.564	1.914
ATT 12.1	0.080	5.00		73.307		95.600	27.472	1.650
MH 12.1			0.0	73.307	1200	95.865	18.471	1.712
RFO 03				86.199	150	90.594	28.567	12.892
MH 12.0				74.057	1200	91.590	15.831	2.735
ATT 11.1	0.070	5.00		70.399		70.640	28.537	2.050
MH 11.1				70.399	1200	71.126	18.728	2.118
MH 11.0				70.399	1200	71.032	16.746	2.288
RFO 04				86.199	150	60.777	19.702	16.550
MH 10.0				70.399	1200	60.704	16.730	2.331
ATT 09.1	0.080	5.00		70.399		46.359	32.167	2.050
MH 09.1				70.339	1200	49.536	24.834	2.045
MH 09.0				70.399	1350	50.188	15.824	2.450
MH 08.0	0.070	5.00		70.399	1350	24.522	14.985	2.530
ATT 07.0				70.399		18.552	24.174	2.564
MH 07.0				69.972	1350	21.432	35.031	2.172
MH 06.0	0.080	5.00		68.366	1350	15.940	70.760	1.300
MH 05.0				68.366	1350	18.994	75.707	1.315
ATT 04.2	0.100	5.00		70.718		81.072	68.788	1.569
MH 04.2				70.799	1200	69.659	65.305	1.807
MH 04.1				70.277	1200	42.450	62.333	1.447
MH 04.0				70.634	1350	40.606	78.994	3.637
RFO 07				89.834	150	32.709	97.746	19.790
MH 03.0				70.794	1350	37.822	99.993	3.849
ATT 02.0	0.090	5.00		70.634		36.390	112.858	3.796
MH 02.0				70.634	1500	34.544	124.711	3.821
ATT 64.0	0.040	5.00		72.946		142.330	23.617	1.650
MH 64.0				72.910	1200	143.731	35.145	1.694
ATT 63.0	0.050	5.00		72.749		143.383	51.144	1.692
MH 63.0				72.749	1200	144.054	60.925	1.790
ATT 62.0	0.090	5.00		72.241		144.207	93.424	1.680
MH 62.0				72.107	1200	146.765	105.511	1.669
MH 61.0				71.973	1200	146.830	117.247	1.652
MH 60.0				71.923	1200	140.560	123.537	1.691
ATT 41.0	0.080	5.00		72.249		89.365	97.922	1.650
MH 41.0				72.403	1200	92.172	102.290	1.840
MH 40.0				72.403	1200	93.108	107.405	1.892

Nodes

Name	Area (ha)	T of E (mins)	Add Inflow (l/s)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
ATT 51.0	0.090	5.00		73.025		120.887	90.766	2.079
MH 51.0				72.596	1200	119.693	97.161	1.695
RFO 05				91.503	150	128.811	103.994	20.104
MH 50.0				72.149	1200	119.960	106.159	1.338
ATT 30.0	0.070	5.00		70.100		114.188	124.767	1.600
MH 30.0				70.000	1350	89.379	129.701	1.578
RFO 06				90.580	150	77.877	106.059	19.850
ATT 21.0	0.090	5.00		70.477		62.517	99.819	2.050
MH 21.0				71.480	1200	65.287	104.515	3.091
MH 20.0				71.480	1200	66.534	107.279	3.197
MH 01.1	0.090	5.00		69.150	1350	59.786	129.070	1.152
MH 01.0				69.000	1200	41.369	134.093	2.211
HEADWALL				64.500		31.573	147.897	1.275
BGR 01	0.030	5.00		89.357		131.567	22.422	0.200
BGR 02	0.020	5.00		89.357		108.656	25.157	0.200
BR 03	0.020	5.00		86.199		82.971	35.912	0.200
BGR 04	0.030	5.00		86.199		57.350	30.282	0.200
BGR 05	0.060	5.00		91.503		131.925	109.341	0.250
BGR 06	0.020	5.00		90.580		81.843	115.104	0.200
BGR 07	0.060	5.00		89.834		29.591	96.381	0.200

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.000	BGR 01	RFO 01	10.093	0.600	89.157	89.157	0.000	0.0	150	5.17	50.0
1.002	MH 14.0	MH 13.0	16.707	0.600	71.492	71.393	0.099	168.8	225	5.66	50.0
1.004	MH 12.0	MH 11.0	20.578	0.600	71.322	68.186	3.136	6.6	225	5.93	50.0
1.003	MH 13.0	MH 12.0	12.025	0.600	71.393	71.322	0.071	169.4	225	5.86	50.0
1.005	MH 11.0	MH 10.0	10.328	0.600	68.111	68.068	0.043	240.2	300	6.10	50.0
1.006	MH 10.0	MH 09.0	10.555	0.600	68.068	68.024	0.044	239.9	300	6.28	50.0
1.007	MH 09.0	MH 08.0	25.680	0.600	67.949	67.869	0.080	321.0	375	6.70	50.0
1.008	MH 08.0	ATT 07.0	10.958	0.600	67.869	67.835	0.034	322.3	375	6.88	50.0
1.009	ATT 07.0	MH 07.0	11.232	0.600	67.835	67.800	0.035	320.9	375	7.07	50.0
1.010	MH 07.0	MH 06.0	36.149	0.600	67.800	67.141	0.659	54.9	375	7.32	50.0
1.011	MH 06.0	MH 05.0	5.814	0.600	67.066	67.051	0.015	387.6	450	7.41	50.0

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
1.000	1.000	17.7	5.7	0.050	0.050	0.030	0.0	0	∞
1.002	1.003	39.9	28.5	1.590	1.689	0.150	0.0	141	1.088
1.004	5.140	204.4	51.2	2.510	1.988	0.270	0.0	77	4.308
1.003	1.002	39.8	32.3	1.689	2.510	0.170	0.0	154	1.112
1.005	1.010	71.4	64.5	1.988	2.031	0.340	0.0	224	1.138
1.006	1.011	71.4	70.2	2.031	2.075	0.370	0.0	243	1.146
1.007	1.006	111.1	85.4	2.075	2.155	0.450	0.0	247	1.105
1.008	1.004	110.8	98.7	2.155	2.189	0.520	0.0	277	1.128
1.009	1.006	111.1	98.7	2.189	1.797	0.520	0.0	276	1.130
1.010	2.450	270.6	98.7	1.797	0.850	0.520	0.0	156	2.265
1.011	1.026	163.2	113.8	0.850	0.865	0.600	0.0	277	1.106

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.012	MH 05.0	MH 04.0	21.861	0.600	67.051	66.997	0.054	404.8	450	7.77	50.0
1.013	MH 04.0	MH 03.0	21.183	0.600	66.997	66.945	0.052	407.4	450	8.13	50.0
1.014	MH 03.0	ATT 02.0	12.944	0.600	66.945	66.913	0.032	404.5	450	8.34	50.0
1.015	ATT 02.0	MH 02.0	11.996	0.600	66.838	66.813	0.025	479.8	525	8.54	50.0
1.016	MH 02.0	MH 01.0	11.602	0.600	66.813	66.789	0.024	483.4	525	8.73	50.0
11.010	MH 01.1	MH 01.0	19.090	0.600	67.998	66.939	1.059	18.0	375	7.48	50.0
1.017	MH 01.0	HEADWALL	16.927	0.600	66.789	63.225	3.564	4.7	525	8.76	50.0
1.001	RFO 01	MH 14.0	10.960	0.600	72.557	72.481	0.076	144.2	150	5.39	50.0
2.000	ATT 14.1	MH 14.1	11.081	0.600	71.657	71.581	0.076	145.8	150	5.22	50.0
2.001	MH 14.1	MH 14.0	2.346	0.600	71.506	71.492	0.014	167.6	225	5.26	50.0
3.000	BGR 02	RFO 02	4.955	0.600	89.157	89.157	0.000	0.0	150	5.08	50.0
3.001	RFO 02	MH 13.0	9.899	0.600	72.557	72.489	0.068	145.6	150	5.28	50.0
5.000	ATT 12.1	MH 12.1	9.005	0.600	71.657	71.595	0.062	145.2	150	5.18	50.0
5.001	MH 12.1	MH 12.0	5.024	0.600	71.595	71.397	0.198	25.4	150	5.22	50.0
4.000	BR 03	RFO 03	10.541	0.600	85.999	85.999	0.000	0.0	150	5.18	50.0
4.001	RFO 03	MH 12.0	12.775	0.600	73.307	73.219	0.088	145.2	150	5.43	50.0
6.000	ATT 11.1	MH 11.1	9.821	0.600	68.349	68.281	0.068	144.4	150	5.20	50.0
6.001	MH 11.1	MH 11.0	1.984	0.600	68.281	68.261	0.020	99.2	150	5.23	50.0
7.000	BGR 04	RFO 04	11.121	0.600	85.999	85.999	0.000	0.0	150	5.19	50.0
7.001	RFO 04	MH 10.0	2.973	0.600	69.649	69.628	0.021	141.6	150	5.24	50.0
8.000	ATT 09.1	MH 09.1	7.992	0.600	68.349	68.294	0.055	145.3	150	5.16	50.0
8.001	MH 09.1	MH 09.0	9.034	0.600	68.294	68.174	0.120	75.3	150	5.29	50.0
9.000	ATT 04.2	MH 04.2	11.933	0.600	69.149	69.067	0.082	145.5	150	5.24	50.0
9.001	MH 04.2	MH 04.1	27.371	0.600	68.992	68.830	0.162	169.0	225	5.69	50.0

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
1.012	1.004	159.7	113.8	0.865	3.187	0.600	0.0	282	1.087
1.013	1.001	159.2	132.8	3.187	3.399	0.700	0.0	316	1.115
1.014	1.004	159.7	144.2	3.399	3.271	0.760	0.0	336	1.130
1.015	1.016	219.9	161.3	3.271	3.296	0.850	0.0	335	1.105
1.016	1.012	219.0	161.3	3.296	1.686	0.850	0.0	336	1.102
11.010	4.284	473.2	129.0	0.777	1.686	0.680	0.0	133	3.666
1.017	10.324	2234.8	290.3	1.686	0.750	1.530	0.0	126	7.230
1.001	0.835	14.7	5.7	16.650	0.676	0.030	0.0	65	0.782
2.000	0.830	14.7	22.8	1.500	1.576	0.120	0.0	150	0.845
2.001	1.007	40.0	22.8	1.576	1.590	0.120	0.0	122	1.039
3.000	1.000	17.7	3.8	0.050	0.050	0.020	0.0	0	∞
3.001	0.831	14.7	3.8	16.650	0.668	0.020	0.0	52	0.697
5.000	0.831	14.7	15.2	1.500	1.562	0.080	0.0	129	0.942
5.001	2.007	35.5	15.2	1.562	2.510	0.080	0.0	68	1.927
4.000	1.000	17.7	3.8	0.050	0.050	0.020	0.0	0	∞
4.001	0.832	14.7	3.8	12.742	0.688	0.020	0.0	52	0.698
6.000	0.834	14.7	13.3	1.900	1.968	0.070	0.0	112	0.942
6.001	1.009	17.8	13.3	1.968	1.988	0.070	0.0	96	1.103
7.000	1.000	17.7	5.7	0.050	0.050	0.030	0.0	0	∞
7.001	0.842	14.9	5.7	16.400	0.621	0.030	0.0	64	0.786
8.000	0.831	14.7	15.2	1.900	1.895	0.080	0.0	129	0.942
8.001	1.160	20.5	15.2	1.895	2.075	0.080	0.0	96	1.268
9.000	0.831	14.7	19.0	1.419	1.582	0.100	0.0	150	0.846
9.001	1.003	39.9	19.0	1.582	1.222	0.100	0.0	109	0.991

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
9.002	MH 04.1	MH 04.0	16.763	0.600	68.830	67.222	1.608	10.4	225	5.76	50.0
11.000	ATT 64.0	MH 64.0	11.613	0.600	71.296	71.216	0.080	145.2	150	5.23	50.0
11.001	MH 64.0	ATT 63.0	16.003	0.600	71.216	71.057	0.159	100.6	150	5.50	50.0
11.002	ATT 63.0	MH 63.0	9.804	0.600	71.057	70.959	0.098	100.0	150	5.66	50.0
11.003	MH 63.0	ATT 62.0	32.499	0.600	70.959	70.636	0.323	100.6	150	6.20	50.0
11.004	ATT 62.0	MH 62.0	12.355	0.600	70.561	70.438	0.123	100.4	225	6.36	50.0
11.005	MH 62.0	MH 61.0	11.736	0.600	70.438	70.321	0.117	100.3	225	6.51	50.0
11.006	MH 61.0	MH 60.0	8.881	0.600	70.321	70.232	0.089	99.8	225	6.62	50.0
11.007	MH 60.0	ATT 30.0	26.401	0.600	70.232	68.650	1.582	16.7	225	6.76	50.0
11.008	ATT 30.0	MH 30.0	25.295	0.600	68.500	68.422	0.078	324.3	375	7.18	50.0
11.009	MH 30.0	MH 01.1	29.600	0.600	68.422	67.998	0.424	69.8	375	7.41	50.0
13.000	ATT 51.0	MH 51.0	6.506	0.600	70.946	70.901	0.045	144.6	150	5.13	50.0
13.001	MH 51.0	MH 50.0	9.002	0.600	70.901	70.811	0.090	100.0	150	5.28	50.0
13.002	MH 50.0	ATT 30.0	19.483	0.600	70.811	68.725	2.086	9.3	150	5.38	50.0
14.000	BGR 05	RFO 05	6.188	0.600	91.253	91.253	0.000	0.0	150	5.10	50.0
14.001	RFO 05	MH 50.0	9.112	0.600	71.399	71.336	0.063	144.6	150	5.29	50.0
12.000	ATT 41.0	MH 41.0	5.192	0.600	70.599	70.563	0.036	144.2	150	5.10	50.0
12.001	MH 41.0	MH 40.0	5.200	0.600	70.563	70.511	0.052	100.0	150	5.19	50.0
12.002	MH 40.0	ATT 30.0	27.309	0.600	70.511	68.725	1.786	15.3	150	5.37	50.0
16.000	ATT 21.0	MH 21.0	5.452	0.600	68.427	68.389	0.038	143.5	150	5.11	50.0
16.001	MH 21.0	MH 20.0	3.032	0.600	68.389	68.358	0.031	97.8	150	5.16	50.0
15.002	MH 20.0	MH 01.1	22.812	0.600	68.283	68.148	0.135	169.0	225	5.77	50.0
15.000	BGR 06	RFO 06	9.876	0.600	90.380	90.380	0.000	0.0	150	5.16	50.0
15.001	RFO 06	MH 20.0	11.408	0.600	70.730	70.651	0.079	144.4	150	5.39	50.0

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
9.002	4.076	162.0	19.0	1.222	3.187	0.100	0.0	51	2.744
11.000	0.832	14.7	7.6	1.500	1.544	0.040	0.0	76	0.838
11.001	1.001	17.7	7.6	1.544	1.542	0.040	0.0	69	0.965
11.002	1.004	17.7	17.1	1.542	1.640	0.090	0.0	119	1.141
11.003	1.001	17.7	17.1	1.640	1.455	0.090	0.0	119	1.138
11.004	1.304	51.9	34.2	1.455	1.444	0.180	0.0	133	1.389
11.005	1.305	51.9	34.2	1.444	1.427	0.180	0.0	133	1.390
11.006	1.309	52.0	34.2	1.427	1.466	0.180	0.0	133	1.394
11.007	3.218	128.0	34.2	1.466	1.225	0.180	0.0	80	2.743
11.008	1.000	110.5	91.1	1.225	1.203	0.480	0.0	260	1.112
11.009	2.171	239.7	91.1	1.203	0.777	0.480	0.0	160	2.028
13.000	0.833	14.7	17.1	1.929	1.545	0.090	0.0	150	0.849
13.001	1.004	17.8	17.1	1.545	1.188	0.090	0.0	119	1.141
13.002	3.316	58.6	28.5	1.188	1.225	0.150	0.0	74	3.289
14.000	1.000	17.7	11.4	0.100	0.100	0.060	0.0	0	∞
14.001	0.833	14.7	11.4	19.954	0.663	0.060	0.0	99	0.919
12.000	0.834	14.7	15.2	1.500	1.690	0.080	0.0	128	0.946
12.001	1.005	17.8	15.2	1.690	1.742	0.080	0.0	107	1.126
12.002	2.589	45.7	15.2	1.742	1.225	0.080	0.0	59	2.331
16.000	0.837	14.8	17.1	1.900	2.941	0.090	0.0	150	0.852
16.001	1.016	18.0	17.1	2.941	2.972	0.090	0.0	117	1.153
15.002	1.003	39.9	20.9	2.972	0.777	0.110	0.0	116	1.014
15.000	1.000	17.7	3.8	0.050	0.050	0.020	0.0	0	∞
15.001	0.834	14.7	3.8	19.700	0.679	0.020	0.0	52	0.700

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
10.000	BGR 07	RFO 07	3.404	0.600	89.634	89.634	0.000	0.0	150	5.06	50.0
10.001	RFO 07	MH 03.0	5.585	0.600	70.044	70.005	0.039	143.2	150	5.17	50.0

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
10.000	1.000	17.7	11.4	0.050	0.050	0.060	0.0	0	∞
10.001	0.837	14.8	11.4	19.640	0.639	0.060	0.0	99	0.922

Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
1.000	10.093	0.0	150	Circular	89.357	89.157	0.050	89.357	89.157	0.050
1.002	16.707	168.8	225	Circular	73.307	71.492	1.590	73.307	71.393	1.689
1.004	20.578	6.6	225	Circular	74.057	71.322	2.510	70.399	68.186	1.988
1.003	12.025	169.4	225	Circular	73.307	71.393	1.689	74.057	71.322	2.510
1.005	10.328	240.2	300	Circular	70.399	68.111	1.988	70.399	68.068	2.031
1.006	10.555	239.9	300	Circular	70.399	68.068	2.031	70.399	68.024	2.075
1.007	25.680	321.0	375	Circular	70.399	67.949	2.075	70.399	67.869	2.155
1.008	10.958	322.3	375	Circular	70.399	67.869	2.155	70.399	67.835	2.189
1.009	11.232	320.9	375	Circular	70.399	67.835	2.189	69.972	67.800	1.797
1.010	36.149	54.9	375	Circular	69.972	67.800	1.797	68.366	67.141	0.850
1.011	5.814	387.6	450	Circular	68.366	67.066	0.850	68.366	67.051	0.865
1.012	21.861	404.8	450	Circular	68.366	67.051	0.865	70.634	66.997	3.187
1.013	21.183	407.4	450	Circular	70.634	66.997	3.187	70.794	66.945	3.399
1.014	12.944	404.5	450	Circular	70.794	66.945	3.399	70.634	66.913	3.271
1.015	11.996	479.8	525	Circular	70.634	66.838	3.271	70.634	66.813	3.296
1.016	11.602	483.4	525	Circular	70.634	66.813	3.296	69.000	66.789	1.686
11.010	19.090	18.0	375	Circular	69.150	67.998	0.777	69.000	66.939	1.686
1.017	16.927	4.7	525	Circular	69.000	66.789	1.686	64.500	63.225	0.750

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	BGR 01		Junction		RFO 01	150	Manhole	Adoptable
1.002	MH 14.0	1200	Manhole	Adoptable	MH 13.0	1200	Manhole	Adoptable
1.004	MH 12.0	1200	Manhole	Adoptable	MH 11.0	1200	Manhole	Adoptable
1.003	MH 13.0	1200	Manhole	Adoptable	MH 12.0	1200	Manhole	Adoptable
1.005	MH 11.0	1200	Manhole	Adoptable	MH 10.0	1200	Manhole	Adoptable
1.006	MH 10.0	1200	Manhole	Adoptable	MH 09.0	1350	Manhole	Adoptable
1.007	MH 09.0	1350	Manhole	Adoptable	MH 08.0	1350	Manhole	Adoptable
1.008	MH 08.0	1350	Manhole	Adoptable	ATT 07.0		Junction	
1.009	ATT 07.0		Junction		MH 07.0	1350	Manhole	Adoptable
1.010	MH 07.0	1350	Manhole	Adoptable	MH 06.0	1350	Manhole	Adoptable
1.011	MH 06.0	1350	Manhole	Adoptable	MH 05.0	1350	Manhole	Adoptable
1.012	MH 05.0	1350	Manhole	Adoptable	MH 04.0	1350	Manhole	Adoptable
1.013	MH 04.0	1350	Manhole	Adoptable	MH 03.0	1350	Manhole	Adoptable
1.014	MH 03.0	1350	Manhole	Adoptable	ATT 02.0		Junction	
1.015	ATT 02.0		Junction		MH 02.0	1500	Manhole	Adoptable
1.016	MH 02.0	1500	Manhole	Adoptable	MH 01.0	1200	Manhole	Adoptable
11.010	MH 01.1	1350	Manhole	Adoptable	MH 01.0	1200	Manhole	Adoptable
1.017	MH 01.0	1200	Manhole	Adoptable	HEADWALL		Junction	

Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
1.001	10.960	144.2	150	Circular	89.357	72.557	16.650	73.307	72.481	0.676
2.000	11.081	145.8	150	Circular	73.307	71.657	1.500	73.307	71.581	1.576
2.001	2.346	167.6	225	Circular	73.307	71.506	1.576	73.307	71.492	1.590
3.000	4.955	0.0	150	Circular	89.357	89.157	0.050	89.357	89.157	0.050
3.001	9.899	145.6	150	Circular	89.357	72.557	16.650	73.307	72.489	0.668
5.000	9.005	145.2	150	Circular	73.307	71.657	1.500	73.307	71.595	1.562
5.001	5.024	25.4	150	Circular	73.307	71.595	1.562	74.057	71.397	2.510
4.000	10.541	0.0	150	Circular	86.199	85.999	0.050	86.199	85.999	0.050
4.001	12.775	145.2	150	Circular	86.199	73.307	12.742	74.057	73.219	0.688
6.000	9.821	144.4	150	Circular	70.399	68.349	1.900	70.399	68.281	1.968
6.001	1.984	99.2	150	Circular	70.399	68.281	1.968	70.399	68.261	1.988
7.000	11.121	0.0	150	Circular	86.199	85.999	0.050	86.199	85.999	0.050
7.001	2.973	141.6	150	Circular	86.199	69.649	16.400	70.399	69.628	0.621
8.000	7.992	145.3	150	Circular	70.399	68.349	1.900	70.339	68.294	1.895
8.001	9.034	75.3	150	Circular	70.339	68.294	1.895	70.399	68.174	2.075
9.000	11.933	145.5	150	Circular	70.718	69.149	1.419	70.799	69.067	1.582
9.001	27.371	169.0	225	Circular	70.799	68.992	1.582	70.277	68.830	1.222
9.002	16.763	10.4	225	Circular	70.277	68.830	1.222	70.634	67.222	3.187
11.000	11.613	145.2	150	Circular	72.946	71.296	1.500	72.910	71.216	1.544
11.001	16.003	100.6	150	Circular	72.910	71.216	1.544	72.749	71.057	1.542
11.002	9.804	100.0	150	Circular	72.749	71.057	1.542	72.749	70.959	1.640
11.003	32.499	100.6	150	Circular	72.749	70.959	1.640	72.241	70.636	1.455
11.004	12.355	100.4	225	Circular	72.241	70.561	1.455	72.107	70.438	1.444
11.005	11.736	100.3	225	Circular	72.107	70.438	1.444	71.973	70.321	1.427
11.006	8.881	99.8	225	Circular	71.973	70.321	1.427	71.923	70.232	1.466

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.001	RFO 01	150	Manhole	Adoptable	MH 14.0	1200	Manhole	Adoptable
2.000	ATT 14.1		Junction		MH 14.1	1200	Manhole	Adoptable
2.001	MH 14.1	1200	Manhole	Adoptable	MH 14.0	1200	Manhole	Adoptable
3.000	BGR 02		Junction		RFO 02	150	Manhole	Adoptable
3.001	RFO 02	150	Manhole	Adoptable	MH 13.0	1200	Manhole	Adoptable
5.000	ATT 12.1		Junction		MH 12.1	1200	Manhole	Adoptable
5.001	MH 12.1	1200	Manhole	Adoptable	MH 12.0	1200	Manhole	Adoptable
4.000	BR 03		Junction		RFO 03	150	Manhole	Adoptable
4.001	RFO 03	150	Manhole	Adoptable	MH 12.0	1200	Manhole	Adoptable
6.000	ATT 11.1		Junction		MH 11.1	1200	Manhole	Adoptable
6.001	MH 11.1	1200	Manhole	Adoptable	MH 11.0	1200	Manhole	Adoptable
7.000	BGR 04		Junction		RFO 04	150	Manhole	Adoptable
7.001	RFO 04	150	Manhole	Adoptable	MH 10.0	1200	Manhole	Adoptable
8.000	ATT 09.1		Junction		MH 09.1	1200	Manhole	Adoptable
8.001	MH 09.1	1200	Manhole	Adoptable	MH 09.0	1350	Manhole	Adoptable
9.000	ATT 04.2		Junction		MH 04.2	1200	Manhole	Adoptable
9.001	MH 04.2	1200	Manhole	Adoptable	MH 04.1	1200	Manhole	Adoptable
9.002	MH 04.1	1200	Manhole	Adoptable	MH 04.0	1350	Manhole	Adoptable
11.000	ATT 64.0		Junction		MH 64.0	1200	Manhole	Adoptable
11.001	MH 64.0	1200	Manhole	Adoptable	ATT 63.0		Junction	
11.002	ATT 63.0		Junction		MH 63.0	1200	Manhole	Adoptable
11.003	MH 63.0	1200	Manhole	Adoptable	ATT 62.0		Junction	
11.004	ATT 62.0		Junction		MH 62.0	1200	Manhole	Adoptable
11.005	MH 62.0	1200	Manhole	Adoptable	MH 61.0	1200	Manhole	Adoptable
11.006	MH 61.0	1200	Manhole	Adoptable	MH 60.0	1200	Manhole	Adoptable

Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
11.007	26.401	16.7	225	Circular	71.923	70.232	1.466	70.100	68.650	1.225
11.008	25.295	324.3	375	Circular	70.100	68.500	1.225	70.000	68.422	1.203
11.009	29.600	69.8	375	Circular	70.000	68.422	1.203	69.150	67.998	0.777
13.000	6.506	144.6	150	Circular	73.025	70.946	1.929	72.596	70.901	1.545
13.001	9.002	100.0	150	Circular	72.596	70.901	1.545	72.149	70.811	1.188
13.002	19.483	9.3	150	Circular	72.149	70.811	1.188	70.100	68.725	1.225
14.000	6.188	0.0	150	Circular	91.503	91.253	0.100	91.503	91.253	0.100
14.001	9.112	144.6	150	Circular	91.503	71.399	19.954	72.149	71.336	0.663
12.000	5.192	144.2	150	Circular	72.249	70.599	1.500	72.403	70.563	1.690
12.001	5.200	100.0	150	Circular	72.403	70.563	1.690	72.403	70.511	1.742
12.002	27.309	15.3	150	Circular	72.403	70.511	1.742	70.100	68.725	1.225
16.000	5.452	143.5	150	Circular	70.477	68.427	1.900	71.480	68.389	2.941
16.001	3.032	97.8	150	Circular	71.480	68.389	2.941	71.480	68.358	2.972
15.002	22.812	169.0	225	Circular	71.480	68.283	2.972	69.150	68.148	0.777
15.000	9.876	0.0	150	Circular	90.580	90.380	0.050	90.580	90.380	0.050
15.001	11.408	144.4	150	Circular	90.580	70.730	19.700	71.480	70.651	0.679
10.000	3.404	0.0	150	Circular	89.834	89.634	0.050	89.834	89.634	0.050
10.001	5.585	143.2	150	Circular	89.834	70.044	19.640	70.794	70.005	0.639

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
11.007	MH 60.0	1200	Manhole	Adoptable	ATT 30.0		Junction	
11.008	ATT 30.0		Junction		MH 30.0	1350	Manhole	Adoptable
11.009	MH 30.0	1350	Manhole	Adoptable	MH 01.1	1350	Manhole	Adoptable
13.000	ATT 51.0		Junction		MH 51.0	1200	Manhole	Adoptable
13.001	MH 51.0	1200	Manhole	Adoptable	MH 50.0	1200	Manhole	Adoptable
13.002	MH 50.0	1200	Manhole	Adoptable	ATT 30.0		Junction	
14.000	BGR 05		Junction		RFO 05	150	Manhole	Adoptable
14.001	RFO 05	150	Manhole	Adoptable	MH 50.0	1200	Manhole	Adoptable
12.000	ATT 41.0		Junction		MH 41.0	1200	Manhole	Adoptable
12.001	MH 41.0	1200	Manhole	Adoptable	MH 40.0	1200	Manhole	Adoptable
12.002	MH 40.0	1200	Manhole	Adoptable	ATT 30.0		Junction	
16.000	ATT 21.0		Junction		MH 21.0	1200	Manhole	Adoptable
16.001	MH 21.0	1200	Manhole	Adoptable	MH 20.0	1200	Manhole	Adoptable
15.002	MH 20.0	1200	Manhole	Adoptable	MH 01.1	1350	Manhole	Adoptable
15.000	BGR 06		Junction		RFO 06	150	Manhole	Adoptable
15.001	RFO 06	150	Manhole	Adoptable	MH 20.0	1200	Manhole	Adoptable
10.000	BGR 07		Junction		RFO 07	150	Manhole	Adoptable
10.001	RFO 07	150	Manhole	Adoptable	MH 03.0	1350	Manhole	Adoptable

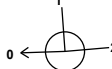
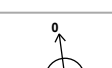
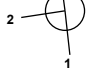
Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)	
ATT 14.1	120.033	22.831	73.307	1.650			0	2.000	71.657	150
MH 14.1	119.913	11.751	73.307	1.801	1200		1	2.000	71.581	150
							0	2.001	71.506	225

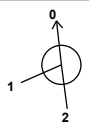
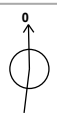
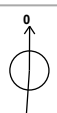
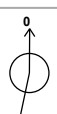
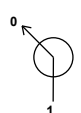
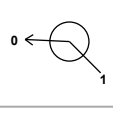
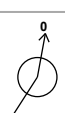
Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)	
RFO 01	129.947	12.460	89.357	16.800	150		1	1.000	89.157	150
							0	1.001	72.557	150
MH 14.0	119.406	9.460	73.307	1.815	1200		1	2.001	71.492	225
							2	1.001	72.481	150
							0	1.002	71.492	225
RFO 02	106.460	20.774	89.357	16.800	150		1	3.000	89.157	150
							0	3.001	72.557	150
MH 13.0	102.832	11.564	73.307	1.914	1200		1	3.001	72.489	150
							2	1.002	71.393	225
							0	1.003	71.393	225
ATT 12.1	95.600	27.472	73.307	1.650						
							0	5.000	71.657	150
MH 12.1	95.865	18.471	73.307	1.712	1200		1	5.000	71.595	150
							0	5.001	71.595	150
RFO 03	90.594	28.567	86.199	12.892	150		1	4.000	85.999	150
							0	4.001	73.307	150
MH 12.0	91.590	15.831	74.057	2.735	1200		1	5.001	71.397	150
							2	4.001	73.219	150
							3	1.003	71.322	225
							0	1.004	71.322	225
ATT 11.1	70.640	28.537	70.399	2.050						
							0	6.000	68.349	150
MH 11.1	71.126	18.728	70.399	2.118	1200		1	6.000	68.281	150
							0	6.001	68.281	150
MH 11.0	71.032	16.746	70.399	2.288	1200		1	6.001	68.261	150
							2	1.004	68.186	225
							0	1.005	68.111	300
RFO 04	60.777	19.702	86.199	16.550	150		1	7.000	85.999	150
							0	7.001	69.649	150
MH 10.0	60.704	16.730	70.399	2.331	1200		1	7.001	69.628	150
							2	1.005	68.068	300
							0	1.006	68.068	300

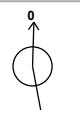
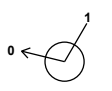
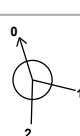
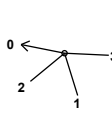
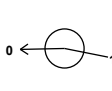
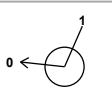
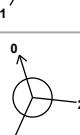
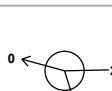
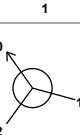
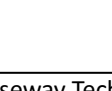
Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)	
ATT 09.1	46.359	32.167	70.399	2.050			0	8.000	68.349	150
MH 09.1	49.536	24.834	70.339	2.045	1200		1	8.000	68.294	150
							0	8.001	68.294	150
MH 09.0	50.188	15.824	70.399	2.450	1350		1	8.001	68.174	150
							2	1.006	68.024	300
							0	1.007	67.949	375
MH 08.0	24.522	14.985	70.399	2.530	1350		1	1.007	67.869	375
							0	1.008	67.869	375
ATT 07.0	18.552	24.174	70.399	2.564			1	1.008	67.835	375
							0	1.009	67.835	375
MH 07.0	21.432	35.031	69.972	2.172	1350		1	1.009	67.800	375
							0	1.010	67.800	375
MH 06.0	15.940	70.760	68.366	1.300	1350		1	1.010	67.141	375
							0	1.011	67.066	450
MH 05.0	18.994	75.707	68.366	1.315	1350		1	1.011	67.051	450
							0	1.012	67.051	450
ATT 04.2	81.072	68.788	70.718	1.569			0	9.000	69.149	150
MH 04.2	69.659	65.305	70.799	1.807	1200		1	9.000	69.067	150
							0	9.001	68.992	225
MH 04.1	42.450	62.333	70.277	1.447	1200		1	9.001	68.830	225
							0	9.002	68.830	225
MH 04.0	40.606	78.994	70.634	3.637	1350		1	9.002	67.222	225
							2	1.012	66.997	450
							0	1.013	66.997	450
RFO 07	32.709	97.746	89.834	19.790	150		1	10.000	89.634	150
							0	10.001	70.044	150

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
MH 03.0	37.822	99.993	70.794	3.849	1350		1 10.001	70.005	150
							2 1.013	66.945	450
							0 1.014	66.945	450
ATT 02.0	36.390	112.858	70.634	3.796			1 1.014	66.913	450
							0 1.015	66.838	525
MH 02.0	34.544	124.711	70.634	3.821	1500		1 1.015	66.813	525
							0 1.016	66.813	525
ATT 64.0	142.330	23.617	72.946	1.650			0 11.000	71.296	150
							1 11.000	71.216	150
MH 64.0	143.731	35.145	72.910	1.694	1200		0 11.001	71.216	150
							1 11.001	71.057	150
ATT 63.0	143.383	51.144	72.749	1.692			1 11.001	71.057	150
							0 11.002	71.057	150
MH 63.0	144.054	60.925	72.749	1.790	1200		1 11.002	70.959	150
							0 11.003	70.959	150
ATT 62.0	144.207	93.424	72.241	1.680			1 11.003	70.636	150
							0 11.004	70.561	225
MH 62.0	146.765	105.511	72.107	1.669	1200		1 11.004	70.438	225
							0 11.005	70.438	225
MH 61.0	146.830	117.247	71.973	1.652	1200		1 11.005	70.321	225
							0 11.006	70.321	225
MH 60.0	140.560	123.537	71.923	1.691	1200		1 11.006	70.232	225
							0 11.007	70.232	225
ATT 41.0	89.365	97.922	72.249	1.650			0 12.000	70.599	150
							1 12.000	70.563	150
MH 41.0	92.172	102.290	72.403	1.840	1200		1 12.000	70.563	150
							0 12.001	70.563	150

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
MH 40.0	93.108	107.405	72.403	1.892	1200		1 12.001	70.511	150
ATT 51.0	120.887	90.766	73.025	2.079			0 12.002	70.511	150
MH 51.0	119.693	97.161	72.596	1.695	1200		0 13.000	70.946	150
RFO 05	128.811	103.994	91.503	20.104	150		1 13.001	70.901	150
MH 50.0	119.960	106.159	72.149	1.338	1200		1 14.000	91.253	150
ATT 30.0	114.188	124.767	70.100	1.600			0 13.001	70.901	150
MH 30.0	89.379	129.701	70.000	1.578	1350		1 13.002	70.811	150
RFO 06	77.877	106.059	90.580	19.850	150		1 11.007	68.725	150
ATT 21.0	62.517	99.819	70.477	2.050			2 12.002	68.725	150
MH 21.0	65.287	104.515	71.480	3.091	1200		3 11.007	68.650	225
MH 20.0	66.534	107.279	71.480	3.197	1200		0 11.008	68.500	375
MH 01.1	59.786	129.070	69.150	1.152	1350		1 11.008	68.422	375
MH 01.0	41.369	134.093	69.000	2.211	1200		0 11.009	68.422	375
							1 15.000	90.380	150
							0 15.001	70.730	150
							0 16.000	68.427	150
							1 16.000	68.389	150
							0 16.001	68.389	150
							1 16.001	68.358	150
							2 15.001	70.651	150
							0 15.002	68.283	225
							1 15.002	68.148	225
							2 11.009	67.998	375
							0 11.010	67.998	375
							1 11.010	66.939	375
							2 1.016	66.789	525
							0 1.017	66.789	525

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
HEADWALL	31.573	147.897	64.500	1.275		1	1.017	63.225	525
BGR 01	131.567	22.422	89.357	0.200					
BGR 02	108.656	25.157	89.357	0.200		0	1.000	89.157	150
BR 03	82.971	35.912	86.199	0.200		0	3.000	89.157	150
BGR 04	57.350	30.282	86.199	0.200		0	4.000	85.999	150
BGR 05	131.925	109.341	91.503	0.250		0	7.000	85.999	150
BGR 06	81.843	115.104	90.580	0.200		0	14.000	91.253	150
BGR 07	29.591	96.381	89.834	0.200		0	15.000	90.380	150
						0	10.000	89.634	150

Simulation Settings

Rainfall Methodology	FEH-22	Analysis Speed	Normal	Starting Level (m)
Rainfall Events	Singular	Skip Steady State	x	Check Discharge Rate(s) x
Summer CV	0.750	Drain Down Time (mins)	240	Check Discharge Volume x
Winter CV	0.840	Additional Storage (m³/ha)	20.0	

Storm Durations

15	60	180	360	600	960	2160	4320	7200	10080
30	120	240	480	720	1440	2880	5760	8640	

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
1	0	0	0
2	0	0	0
30	40	0	0
100	0	0	0
100	40	0	0

Node BGR 01 Online Orifice Control

Flap Valve	x	Invert Level (m)	89.157	Diameter (m)	0.012
Downstream Link	1.000	Design Depth (m)	0.400	Discharge Coefficient	0.600
Replaces Downstream Link	x	Design Flow (l/s)	0.2		

Node BGR 02 Online Orifice Control

Flap Valve	x	Invert Level (m)	89.157	Diameter (m)	0.012
Downstream Link	3.000	Design Depth (m)	0.400	Discharge Coefficient	0.600
Replaces Downstream Link	x	Design Flow (l/s)	0.2		

Node BR 03 Online Orifice Control

Flap Valve	x	Invert Level (m)	85.999	Diameter (m)	0.012
Downstream Link	4.000	Design Depth (m)	0.400	Discharge Coefficient	0.600
Replaces Downstream Link	x	Design Flow (l/s)	0.2		

Node BGR 04 Online Orifice Control

Flap Valve	x	Invert Level (m)	85.999	Diameter (m)	0.012
Downstream Link	7.000	Design Depth (m)	0.400	Discharge Coefficient	0.600
Replaces Downstream Link	x	Design Flow (l/s)	0.2		

Node BGR 05 Online Orifice Control

Flap Valve	x	Invert Level (m)	91.253	Diameter (m)	0.012
Downstream Link	14.000	Design Depth (m)	0.400	Discharge Coefficient	0.600
Replaces Downstream Link	x	Design Flow (l/s)	0.2		

Node BGR 06 Online Orifice Control

Flap Valve	x	Invert Level (m)	90.380	Diameter (m)	0.014
Downstream Link	15.000	Design Depth (m)	0.400	Discharge Coefficient	0.600
Replaces Downstream Link	x	Design Flow (l/s)	0.2		

Node BGR 07 Online Orifice Control

Flap Valve	x	Invert Level (m)	89.634	Diameter (m)	0.012
Downstream Link	10.000	Design Depth (m)	0.400	Discharge Coefficient	0.600
Replaces Downstream Link	x	Design Flow (l/s)	0.2		

Node MH 14.1 Online Orifice Control

Flap Valve	x	Invert Level (m)	71.506	Diameter (m)	0.032
Downstream Link	2.001	Design Depth (m)	0.500	Discharge Coefficient	0.600
Replaces Downstream Link	x	Design Flow (l/s)	1.5		

Node MH 12.1 Online Orifice Control

Flap Valve	x	Invert Level (m)	71.595	Diameter (m)	0.019
Downstream Link	5.001	Design Depth (m)	1.500	Discharge Coefficient	0.600
Replaces Downstream Link	x	Design Flow (l/s)	1.0		

Node MH 11.1 Online Orifice Control

Flap Valve	x	Invert Level (m)	68.281	Diameter (m)	0.020
Downstream Link	6.001	Design Depth (m)	1.400	Discharge Coefficient	0.600
Replaces Downstream Link	x	Design Flow (l/s)	1.0		

Node MH 09.1 Online Orifice Control

Flap Valve	x	Invert Level (m)	68.294	Diameter (m)	0.019
Downstream Link	8.001	Design Depth (m)	1.500	Discharge Coefficient	0.600
Replaces Downstream Link	x	Design Flow (l/s)	1.0		

Node MH 07.0 Online Orifice Control

Flap Valve	x	Invert Level (m)	67.800	Diameter (m)	0.024
Downstream Link	1.010	Design Depth (m)	1.500	Discharge Coefficient	0.600
Replaces Downstream Link	x	Design Flow (l/s)	1.5		

Node MH 04.2 Online Orifice Control

Flap Valve	x	Invert Level (m)	68.992	Diameter (m)	0.019
Downstream Link	9.001	Design Depth (m)	1.500	Discharge Coefficient	0.600
Replaces Downstream Link	x	Design Flow (l/s)	1.0		

Node MH 02.0 Online Orifice Control

Flap Valve	x	Invert Level (m)	66.813	Diameter (m)	0.048
Downstream Link	1.016	Design Depth (m)	1.250	Discharge Coefficient	0.600
Replaces Downstream Link	x	Design Flow (l/s)	5.5		

Node MH 64.0 Online Orifice Control

Flap Valve	x	Invert Level (m)	71.216	Diameter (m)	0.019
Downstream Link	11.001	Design Depth (m)	1.500	Discharge Coefficient	0.600
Replaces Downstream Link	x	Design Flow (l/s)	1.0		

Node MH 63.0 Online Orifice Control

Flap Valve	x	Invert Level (m)	70.959	Diameter (m)	0.020
Downstream Link	11.003	Design Depth (m)	1.500	Discharge Coefficient	0.600
Replaces Downstream Link	x	Design Flow (l/s)	1.0		

Node MH 62.0 Online Orifice Control

Flap Valve	x	Invert Level (m)	70.438	Diameter (m)	0.026
Downstream Link	11.005	Design Depth (m)	1.000	Discharge Coefficient	0.600
Replaces Downstream Link	x	Design Flow (l/s)	1.5		

Node MH 51.0 Online Orifice Control

Flap Valve	x	Invert Level (m)	70.901	Diameter (m)	0.049
Downstream Link	13.001	Design Depth (m)	0.500	Discharge Coefficient	0.600
Replaces Downstream Link	x	Design Flow (l/s)	3.5		

Node MH 41.0 Online Orifice Control

Flap Valve	x	Invert Level (m)	70.563	Diameter (m)	0.044
Downstream Link	12.001	Design Depth (m)	0.750	Discharge Coefficient	0.600
Replaces Downstream Link	x	Design Flow (l/s)	3.5		

Node MH 21.0 Online Orifice Control

Flap Valve	x	Invert Level (m)	68.389	Diameter (m)	0.044
Downstream Link	16.001	Design Depth (m)	0.750	Discharge Coefficient	0.600
Replaces Downstream Link	x	Design Flow (l/s)	3.5		

Node MH 30.0 Online Orifice Control

Flap Valve	x	Invert Level (m)	68.422	Diameter (m)	0.042
Downstream Link	11.009	Design Depth (m)	1.750	Discharge Coefficient	0.600
Replaces Downstream Link	x	Design Flow (l/s)	5.0		

Node MH 01.0 Online Head/Flow Control

Flap Valve	x	Replaces Downstream Link	x
Downstream Link	1.017	Invert Level (m)	66.789

Head (m)	Flow (l/s)	Head (m)	Flow (l/s)	Head (m)	Flow (l/s)
0.100	11.000	0.250	30.000	0.275	42.000

Node BGR 01 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	89.157
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	256.0	0.0	0.200	256.0	0.0	0.201	0.0	0.0

Node BGR 02 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	89.157
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	249.4	0.0	0.200	249.4	0.0	0.201	0.0	0.0

Node ATT 14.1 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	71.657
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	107.3	0.0	0.800	107.3	0.0	0.801	0.0	0.0

Node ATT 12.1 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	71.657
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	81.0	0.0	0.800	81.0	0.0	0.801	0.0	0.0

Node BR 03 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	85.999
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	220.9	0.0	0.200	220.9	0.0	0.201	0.0	0.0

Node ATT 11.1 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	68.349
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	64.0	0.0	0.800	64.0	0.0	0.801	0.0	0.0

Node BGR 04 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	85.999
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	261.0	0.0	0.200	261.0	0.0	0.201	0.0	0.0

Node ATT 09.1 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	68.349
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	54.0	0.0	1.200	54.0	0.0	1.201	0.0	0.0

Node ATT 07.0 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	67.835
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	185.0	0.0	1.200	185.0	0.0	1.201	0.0	0.0

Node ATT 04.2 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	69.149
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	114.0	0.0	0.800	114.0	0.0	0.801	0.0	0.0

Node ATT 02.0 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	66.838
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	66.0	0.0	1.200	66.0	0.0	1.201	0.0	0.0

Node ATT 30.0 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	68.500
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	167.2	0.0	1.200	167.2	0.0	1.201	0.0	0.0

Node ATT 21.0 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	68.427
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	100

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	49.5	0.0	1.200	49.5	0.0	1.201	0.0	0.0

Node BGR 06 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	90.380
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	229.6	0.0	0.200	229.6	0.0	0.201	0.0	0.0

Node ATT 41.0 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	70.599
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	120

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	45.0	0.0	0.800	45.0	0.0	0.801	0.0	0.0

Node ATT 51.0 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	70.946
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	112

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	49.5	0.0	0.800	49.5	0.0	0.801	0.0	0.0

Node BGR 05 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	91.253
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	620.8	0.0	0.200	620.8	0.0	0.201	0.0	0.0

Node ATT 62.0 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	70.561
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	69.0	0.0	1.200	69.0	0.0	1.201	0.0	0.0

Node ATT 63.0 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	71.057
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	30.0	0.0	1.200	30.0	0.0	1.201	0.0	0.0

Node ATT 64.0 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	71.296
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	45.0	0.0	0.800	45.0	0.0	0.801	0.0	0.0

Node BGR 07 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	89.634
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	611.6	0.0	0.200	611.6	0.0	0.201	0.0	0.0

Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
1 year 15 minute summer	62.595	17.712
1 year 15 minute winter	43.926	17.712
1 year 30 minute summer	39.581	11.200
1 year 30 minute winter	27.776	11.200
1 year 60 minute summer	26.110	6.900
1 year 60 minute winter	17.347	6.900
1 year 120 minute summer	21.190	5.600
1 year 120 minute winter	14.078	5.600
1 year 180 minute summer	17.947	4.618
1 year 180 minute winter	11.666	4.618
1 year 240 minute summer	14.878	3.932
1 year 240 minute winter	9.885	3.932
1 year 360 minute summer	11.805	3.038
1 year 360 minute winter	7.674	3.038
1 year 480 minute summer	9.395	2.483
1 year 480 minute winter	6.242	2.483
1 year 600 minute summer	7.714	2.110
1 year 600 minute winter	5.271	2.110
1 year 720 minute summer	6.873	1.842
1 year 720 minute winter	4.619	1.842
1 year 960 minute summer	5.630	1.482
1 year 960 minute winter	3.729	1.482
1 year 1440 minute summer	4.078	1.093
1 year 1440 minute winter	2.741	1.093
1 year 2160 minute summer	2.945	0.814
1 year 2160 minute winter	2.029	0.814
1 year 2880 minute summer	2.487	0.666
1 year 2880 minute winter	1.671	0.666
1 year 4320 minute summer	1.964	0.514
1 year 4320 minute winter	1.294	0.514
1 year 5760 minute summer	1.695	0.434
1 year 5760 minute winter	1.097	0.434
1 year 7200 minute summer	1.509	0.385
1 year 7200 minute winter	0.974	0.385
1 year 8640 minute summer	1.379	0.352
1 year 8640 minute winter	0.890	0.352
1 year 10080 minute summer	1.286	0.328
1 year 10080 minute winter	0.830	0.328
2 year 15 minute summer	105.003	29.712
2 year 15 minute winter	73.686	29.712
2 year 30 minute summer	66.439	18.800
2 year 30 minute winter	46.624	18.800
2 year 60 minute summer	43.516	11.500
2 year 60 minute winter	28.911	11.500
2 year 120 minute summer	31.975	8.450
2 year 120 minute winter	21.243	8.450
2 year 180 minute summer	26.077	6.710
2 year 180 minute winter	16.951	6.710
2 year 240 minute summer	21.169	5.594
2 year 240 minute winter	14.064	5.594
2 year 360 minute summer	16.422	4.226
2 year 360 minute winter	10.675	4.226

Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
2 year 480 minute summer	12.909	3.412
2 year 480 minute winter	8.577	3.412
2 year 600 minute summer	10.508	2.874
2 year 600 minute winter	7.180	2.874
2 year 720 minute summer	9.299	2.492
2 year 720 minute winter	6.249	2.492
2 year 960 minute summer	7.531	1.983
2 year 960 minute winter	4.989	1.983
2 year 1440 minute summer	5.381	1.442
2 year 1440 minute winter	3.616	1.442
2 year 2160 minute summer	3.826	1.057
2 year 2160 minute winter	2.636	1.057
2 year 2880 minute summer	3.192	0.856
2 year 2880 minute winter	2.145	0.856
2 year 4320 minute summer	2.481	0.649
2 year 4320 minute winter	1.634	0.649
2 year 5760 minute summer	2.115	0.541
2 year 5760 minute winter	1.369	0.541
2 year 7200 minute summer	1.863	0.475
2 year 7200 minute winter	1.202	0.475
2 year 8640 minute summer	1.687	0.430
2 year 8640 minute winter	1.089	0.430
2 year 10080 minute summer	1.561	0.398
2 year 10080 minute winter	1.007	0.398
30 year +40% CC 15 minute summer	432.868	122.487
30 year +40% CC 15 minute winter	303.767	122.487
30 year +40% CC 30 minute summer	277.128	78.418
30 year +40% CC 30 minute winter	194.476	78.418
30 year +40% CC 60 minute summer	181.313	47.916
30 year +40% CC 60 minute winter	120.460	47.916
30 year +40% CC 120 minute summer	114.640	30.296
30 year +40% CC 120 minute winter	76.164	30.296
30 year +40% CC 180 minute summer	88.389	22.746
30 year +40% CC 180 minute winter	57.455	22.746
30 year +40% CC 240 minute summer	69.550	18.380
30 year +40% CC 240 minute winter	46.207	18.380
30 year +40% CC 360 minute summer	52.072	13.400
30 year +40% CC 360 minute winter	33.848	13.400
30 year +40% CC 480 minute summer	40.121	10.603
30 year +40% CC 480 minute winter	26.655	10.603
30 year +40% CC 600 minute summer	32.197	8.807
30 year +40% CC 600 minute winter	21.999	8.807
30 year +40% CC 720 minute summer	28.176	7.552
30 year +40% CC 720 minute winter	18.936	7.552
30 year +40% CC 960 minute summer	22.425	5.905
30 year +40% CC 960 minute winter	14.855	5.905
30 year +40% CC 1440 minute summer	15.600	4.181
30 year +40% CC 1440 minute winter	10.484	4.181
30 year +40% CC 2160 minute summer	10.732	2.966
30 year +40% CC 2160 minute winter	7.395	2.966
30 year +40% CC 2880 minute summer	8.712	2.335
30 year +40% CC 2880 minute winter	5.855	2.335

Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
30 year +40% CC 4320 minute summer	6.463	1.690
30 year +40% CC 4320 minute winter	4.256	1.690
30 year +40% CC 5760 minute summer	5.304	1.358
30 year +40% CC 5760 minute winter	3.433	1.358
30 year +40% CC 7200 minute summer	4.530	1.156
30 year +40% CC 7200 minute winter	2.924	1.156
30 year +40% CC 8640 minute summer	3.995	1.019
30 year +40% CC 8640 minute winter	2.578	1.019
30 year +40% CC 10080 minute summer	3.609	0.921
30 year +40% CC 10080 minute winter	2.329	0.921
100 year 15 minute summer	402.514	113.898
100 year 15 minute winter	282.466	113.898
100 year 30 minute summer	259.760	73.503
100 year 30 minute winter	182.287	73.503
100 year 60 minute summer	170.515	45.062
100 year 60 minute winter	113.286	45.062
100 year 120 minute summer	106.976	28.271
100 year 120 minute winter	71.073	28.271
100 year 180 minute summer	82.913	21.336
100 year 180 minute winter	53.896	21.336
100 year 240 minute summer	65.650	17.349
100 year 240 minute winter	43.617	17.349
100 year 360 minute summer	49.650	12.777
100 year 360 minute winter	32.274	12.777
100 year 480 minute summer	38.518	10.179
100 year 480 minute winter	25.590	10.179
100 year 600 minute summer	31.035	8.489
100 year 600 minute winter	21.205	8.489
100 year 720 minute summer	27.222	7.296
100 year 720 minute winter	18.295	7.296
100 year 960 minute summer	21.695	5.713
100 year 960 minute winter	14.371	5.713
100 year 1440 minute summer	15.006	4.022
100 year 1440 minute winter	10.085	4.022
100 year 2160 minute summer	10.172	2.811
100 year 2160 minute winter	7.009	2.811
100 year 2880 minute summer	8.139	2.181
100 year 2880 minute winter	5.470	2.181
100 year 4320 minute summer	5.870	1.535
100 year 4320 minute winter	3.865	1.535
100 year 5760 minute summer	4.703	1.204
100 year 5760 minute winter	3.044	1.204
100 year 7200 minute summer	3.942	1.006
100 year 7200 minute winter	2.544	1.006
100 year 8640 minute summer	3.422	0.873
100 year 8640 minute winter	2.209	0.873
100 year 10080 minute summer	3.052	0.779
100 year 10080 minute winter	1.970	0.779
100 year +40% CC 15 minute summer	563.520	159.457
100 year +40% CC 15 minute winter	395.453	159.457
100 year +40% CC 30 minute summer	363.663	102.904
100 year +40% CC 30 minute winter	255.202	102.904

Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
100 year +40% CC 60 minute summer	238.721	63.087
100 year +40% CC 60 minute winter	158.601	63.087
100 year +40% CC 120 minute summer	149.767	39.579
100 year +40% CC 120 minute winter	99.502	39.579
100 year +40% CC 180 minute summer	116.078	29.871
100 year +40% CC 180 minute winter	75.454	29.871
100 year +40% CC 240 minute summer	91.911	24.289
100 year +40% CC 240 minute winter	61.063	24.289
100 year +40% CC 360 minute summer	69.510	17.887
100 year +40% CC 360 minute winter	45.183	17.887
100 year +40% CC 480 minute summer	53.925	14.251
100 year +40% CC 480 minute winter	35.826	14.251
100 year +40% CC 600 minute summer	43.449	11.884
100 year +40% CC 600 minute winter	29.687	11.884
100 year +40% CC 720 minute summer	38.110	10.214
100 year +40% CC 720 minute winter	25.613	10.214
100 year +40% CC 960 minute summer	30.373	7.998
100 year +40% CC 960 minute winter	20.120	7.998
100 year +40% CC 1440 minute summer	21.008	5.630
100 year +40% CC 1440 minute winter	14.119	5.630
100 year +40% CC 2160 minute summer	14.241	3.936
100 year +40% CC 2160 minute winter	9.812	3.936
100 year +40% CC 2880 minute summer	11.395	3.054
100 year +40% CC 2880 minute winter	7.658	3.054
100 year +40% CC 4320 minute summer	8.217	2.148
100 year +40% CC 4320 minute winter	5.412	2.148
100 year +40% CC 5760 minute summer	6.584	1.685
100 year +40% CC 5760 minute winter	4.261	1.685
100 year +40% CC 7200 minute summer	5.519	1.408
100 year +40% CC 7200 minute winter	3.562	1.408
100 year +40% CC 8640 minute summer	4.791	1.222
100 year +40% CC 8640 minute winter	3.092	1.222
100 year +40% CC 10080 minute summer	4.273	1.090
100 year +40% CC 10080 minute winter	2.758	1.090

Results for 1 year Critical Storm Duration. Lowest mass balance: 99.55%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
240 minute winter	ATT 14.1	172	71.735	0.078	3.2	8.0617	0.0000	OK
240 minute winter	MH 14.1	164	71.736	0.230	2.6	0.2604	0.0000	SURCHARGED
7200 minute winter	RFO 01	4380	72.563	0.006	0.0	0.0001	0.0000	OK
240 minute winter	MH 14.0	180	71.516	0.024	1.0	0.0275	0.0000	OK
2880 minute winter	RFO 02	1860	72.562	0.005	0.0	0.0001	0.0000	OK
240 minute winter	MH 13.0	180	71.419	0.026	1.0	0.0300	0.0000	OK
480 minute winter	ATT 12.1	368	71.757	0.100	1.4	7.7698	0.0000	OK
480 minute winter	MH 12.1	368	71.757	0.162	0.8	0.1829	0.0000	SURCHARGED
2880 minute winter	RFO 03	1860	73.312	0.005	0.0	0.0001	0.0000	OK
360 minute winter	MH 12.0	264	71.335	0.013	1.3	0.0147	0.0000	OK
360 minute winter	ATT 11.1	272	68.448	0.099	1.3	6.1138	0.0000	OK
360 minute winter	MH 11.1	272	68.448	0.167	0.9	0.1893	0.0000	SURCHARGED
360 minute winter	MH 11.0	264	68.143	0.032	1.6	0.0359	0.0000	OK
7200 minute winter	RFO 04	4380	69.655	0.006	0.0	0.0001	0.0000	OK
2160 minute winter	MH 10.0	2040	68.124	0.056	1.1	0.0638	0.0000	OK
480 minute winter	ATT 09.1	352	68.490	0.141	1.3	7.3322	0.0000	OK
480 minute winter	MH 09.1	352	68.490	0.196	0.7	0.2214	0.0000	SURCHARGED
2160 minute winter	MH 09.0	2040	68.124	0.175	1.3	0.2510	0.0000	OK
2160 minute winter	MH 08.0	2040	68.124	0.255	1.6	0.5070	0.0000	OK
2160 minute winter	ATT 07.0	2040	68.124	0.289	1.6	50.8628	0.0000	OK
2160 minute winter	MH 07.0	2040	68.124	0.324	0.7	0.4642	0.0000	OK
15 minute winter	MH 06.0	10	67.130	0.064	6.4	0.1715	0.0000	OK
15 minute winter	MH 05.0	11	67.113	0.062	6.3	0.0881	0.0000	OK
360 minute winter	ATT 04.2	288	69.237	0.088	1.8	9.6390	0.0000	OK
360 minute winter	MH 04.2	288	69.237	0.245	1.0	0.2770	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
240 minute winter	ATT 14.1	2.000	MH 14.1	2.6	0.423	0.177	0.1488	
240 minute winter	MH 14.1	2.001	MH 14.0	1.0	0.408	0.024	0.0056	
7200 minute winter	RFO 01	1.001	MH 14.0	0.0	0.202	0.002	0.0020	
240 minute winter	MH 14.0	1.002	MH 13.0	1.0	0.400	0.025	0.0409	
2880 minute winter	RFO 02	3.001	MH 13.0	0.0	0.198	0.002	0.0012	
240 minute winter	MH 13.0	1.003	MH 12.0	1.0	0.588	0.025	0.0211	
480 minute winter	ATT 12.1	5.000	MH 12.1	0.8	0.131	0.051	0.1352	
480 minute winter	MH 12.1	5.001	MH 12.0	0.3	0.601	0.008	0.0025	
2880 minute winter	RFO 03	4.001	MH 12.0	0.0	0.198	0.002	0.0016	
360 minute winter	MH 12.0	1.004	MH 11.0	1.3	1.430	0.006	0.0185	
360 minute winter	ATT 11.1	6.000	MH 11.1	0.9	0.144	0.060	0.1473	
360 minute winter	MH 11.1	6.001	MH 11.0	0.3	0.378	0.018	0.0017	
360 minute winter	MH 11.0	1.005	MH 10.0	1.6	0.405	0.023	0.0411	
7200 minute winter	RFO 04	7.001	MH 10.0	0.0	0.203	0.002	0.0005	
2160 minute winter	MH 10.0	1.006	MH 09.0	1.1	0.386	0.015	0.1573	
480 minute winter	ATT 09.1	8.000	MH 09.1	0.7	0.151	0.049	0.1389	
480 minute winter	MH 09.1	8.001	MH 09.0	0.3	0.426	0.016	0.0068	
2160 minute winter	MH 09.0	1.007	MH 08.0	1.3	0.265	0.012	1.6755	
2160 minute winter	MH 08.0	1.008	ATT 07.0	1.6	0.378	0.014	0.9382	
2160 minute winter	ATT 07.0	1.009	MH 07.0	0.7	0.080	0.006	1.0818	
2160 minute winter	MH 07.0	1.010	MH 06.0	0.7	0.528	0.002	0.0459	
15 minute winter	MH 06.0	1.011	MH 05.0	6.3	0.469	0.039	0.0780	
15 minute winter	MH 05.0	1.012	MH 04.0	6.3	0.485	0.039	0.2857	
360 minute winter	ATT 04.2	9.000	MH 04.2	1.0	0.309	0.065	0.1691	
360 minute winter	MH 04.2	9.001	MH 04.1	0.4	0.425	0.009	0.0240	

Results for 1 year Critical Storm Duration. Lowest mass balance: 99.55%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
360 minute winter	MH 04.1	296	68.838	0.008	0.4	0.0092	0.0000	OK
15 minute winter	MH 04.0	11	67.059	0.062	6.3	0.0888	0.0000	OK
10080 minute winter	RFO 07	6900	70.050	0.006	0.0	0.0001	0.0000	OK
360 minute winter	MH 03.0	256	67.025	0.080	2.1	0.1148	0.0000	OK
360 minute winter	ATT 02.0	256	67.025	0.187	3.7	11.8184	0.0000	OK
360 minute winter	MH 02.0	256	67.025	0.212	2.0	0.3747	0.0000	OK
240 minute winter	ATT 64.0	180	71.359	0.063	1.1	2.7349	0.0000	OK
240 minute winter	MH 64.0	180	71.361	0.145	0.8	0.1641	0.0000	OK
360 minute winter	ATT 63.0	328	71.226	0.169	1.5	4.9165	0.0000	SURCHARGED
360 minute winter	MH 63.0	328	71.226	0.267	1.1	0.3019	0.0000	SURCHARGED
360 minute winter	ATT 62.0	336	70.695	0.134	3.6	8.9049	0.0000	OK
600 minute winter	MH 62.0	450	70.696	0.258	2.2	0.2913	0.0000	SURCHARGED
360 minute winter	MH 61.0	336	70.341	0.020	0.7	0.0221	0.0000	OK
360 minute winter	MH 60.0	336	70.244	0.012	0.7	0.0136	0.0000	OK
120 minute winter	ATT 41.0	84	70.675	0.076	2.6	3.3314	0.0000	OK
120 minute winter	MH 41.0	82	70.679	0.116	2.6	0.1310	0.0000	OK
120 minute winter	MH 40.0	84	70.528	0.017	1.2	0.0189	0.0000	OK
120 minute winter	ATT 51.0	82	71.018	0.072	3.7	3.4505	0.0000	OK
120 minute summer	MH 51.0	74	71.025	0.124	2.9	0.1399	0.0000	OK
10080 minute winter	RFO 05	6900	71.405	0.006	0.0	0.0001	0.0000	OK
120 minute winter	MH 50.0	82	70.828	0.017	1.4	0.0187	0.0000	OK
360 minute winter	ATT 30.0	312	68.644	0.144	4.1	23.0101	0.0000	OK
360 minute winter	MH 30.0	312	68.644	0.222	1.7	0.3178	0.0000	OK
2880 minute winter	RFO 06	1860	70.735	0.005	0.0	0.0001	0.0000	OK
180 minute winter	ATT 21.0	124	68.512	0.085	3.0	4.0500	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
360 minute winter	MH 04.1	9.002	MH 04.0	0.4	0.840	0.002	0.0072	
15 minute winter	MH 04.0	1.013	MH 03.0	6.2	0.495	0.039	0.2689	
10080 minute winter	RFO 07	10.001	MH 03.0	0.0	0.203	0.003	0.0011	
360 minute winter	MH 03.0	1.014	ATT 02.0	2.1	0.396	0.013	0.3224	
360 minute winter	ATT 02.0	1.015	MH 02.0	2.0	0.125	0.009	0.9033	
360 minute winter	MH 02.0	1.016	MH 01.0	2.0	0.230	0.009	0.1614	
240 minute winter	ATT 64.0	11.000	MH 64.0	0.8	0.161	0.054	0.1422	
240 minute winter	MH 64.0	11.001	ATT 63.0	0.3	0.189	0.015	0.1468	
360 minute winter	ATT 63.0	11.002	MH 63.0	1.1	0.166	0.061	0.1726	
360 minute winter	MH 63.0	11.003	ATT 62.0	0.4	0.399	0.024	0.1199	
360 minute winter	ATT 62.0	11.004	MH 62.0	3.1	0.154	0.060	0.3975	
600 minute winter	MH 62.0	11.005	MH 61.0	0.7	0.436	0.013	0.0185	
360 minute winter	MH 61.0	11.006	MH 60.0	0.7	0.571	0.013	0.0109	
360 minute winter	MH 60.0	11.007	ATT 30.0	0.7	0.855	0.005	0.0213	
120 minute winter	ATT 41.0	12.000	MH 41.0	2.6	0.359	0.177	0.0610	
120 minute winter	MH 41.0	12.001	MH 40.0	1.2	0.716	0.066	0.0087	
120 minute winter	MH 40.0	12.002	ATT 30.0	1.2	1.103	0.026	0.0290	
120 minute winter	ATT 51.0	13.000	MH 51.0	3.2	0.360	0.220	0.0749	
120 minute summer	MH 51.0	13.001	MH 50.0	1.4	0.799	0.081	0.0169	
10080 minute winter	RFO 05	14.001	MH 50.0	0.0	0.202	0.003	0.0017	
120 minute winter	MH 50.0	13.002	ATT 30.0	1.5	1.400	0.025	0.0203	
360 minute winter	ATT 30.0	11.008	MH 30.0	1.7	0.140	0.015	1.3520	
360 minute winter	MH 30.0	11.009	MH 01.1	1.6	0.718	0.007	0.0799	
2880 minute winter	RFO 06	15.001	MH 20.0	0.0	0.200	0.002	0.0016	
180 minute winter	ATT 21.0	16.000	MH 21.0	2.8	0.363	0.191	0.0701	

Results for 1 year Critical Storm Duration. Lowest mass balance: 99.55%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
180 minute winter	MH 21.0	120	68.513	0.124	2.8	0.1398	0.0000	OK
180 minute winter	MH 20.0	124	68.310	0.027	1.2	0.0310	0.0000	OK
15 minute winter	MH 01.1	11	68.031	0.033	7.4	0.0987	0.0000	OK
15 minute winter	MH 01.0	12	66.877	0.088	7.4	0.0995	0.0000	OK
15 minute winter	HEADWALL	12	63.247	0.022	7.2	0.0000	0.0000	OK
7200 minute winter	BGR 01	4380	89.185	0.028	0.1	6.9712	0.0000	OK
2880 minute winter	BGR 02	1860	89.173	0.016	0.1	3.8721	0.0000	OK
2880 minute winter	BR 03	1860	86.017	0.018	0.1	3.8516	0.0000	OK
7200 minute winter	BGR 04	4380	86.027	0.028	0.1	7.0191	0.0000	OK
10080 minute winter	BGR 05	6900	91.282	0.029	0.1	17.1914	0.0000	OK
2880 minute winter	BGR 06	1860	90.397	0.017	0.1	3.7977	0.0000	OK
10080 minute winter	BGR 07	6900	89.663	0.029	0.1	16.9170	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
180 minute winter	MH 21.0	16.001	MH 20.0	1.2	0.560	0.069	0.0067	
180 minute winter	MH 20.0	15.002	MH 01.1	1.2	0.456	0.031	0.0623	
15 minute winter	MH 01.1	11.010	MH 01.0	7.3	1.579	0.015	0.0883	
15 minute winter	MH 01.0	1.017	HEADWALL	7.2	2.423	0.003	0.0505	31.0
7200 minute winter	BGR 01	1.000	RFO 01	0.0	0.083	0.002	0.0048	
2880 minute winter	BGR 02	3.000	RFO 02	0.0	0.084	0.001	0.0015	
2880 minute winter	BR 03	4.000	RFO 03	0.0	0.071	0.001	0.0039	
7200 minute winter	BGR 04	7.000	RFO 04	0.0	0.081	0.002	0.0054	
10080 minute winter	BGR 05	14.000	RFO 05	0.0	0.093	0.002	0.0027	
2880 minute winter	BGR 06	15.000	RFO 06	0.0	0.076	0.002	0.0040	
10080 minute winter	BGR 07	10.000	RFO 07	0.0	0.105	0.002	0.0013	

Results for 2 year Critical Storm Duration. Lowest mass balance: 99.55%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
240 minute winter	ATT 14.1	180	71.782	0.125	4.4	12.8882	0.0000	OK
240 minute winter	MH 14.1	180	71.781	0.275	2.3	0.3114	0.0000	SURCHARGED
8640 minute winter	RFO 01	5400	72.563	0.006	0.0	0.0001	0.0000	OK
240 minute winter	MH 14.0	184	71.518	0.026	1.1	0.0289	0.0000	OK
2880 minute winter	RFO 02	1980	72.562	0.005	0.0	0.0001	0.0000	OK
240 minute winter	MH 13.0	188	71.421	0.028	1.1	0.0316	0.0000	OK
360 minute winter	ATT 12.1	328	71.807	0.150	2.0	11.7016	0.0000	SURCHARGED
360 minute winter	MH 12.1	328	71.807	0.212	0.8	0.2399	0.0000	SURCHARGED
2880 minute winter	RFO 03	1980	73.312	0.005	0.0	0.0001	0.0000	OK
240 minute winter	MH 12.0	192	71.336	0.014	1.5	0.0156	0.0000	OK
360 minute winter	ATT 11.1	280	68.498	0.149	1.8	9.1820	0.0000	OK
360 minute winter	MH 11.1	280	68.498	0.217	0.8	0.2458	0.0000	SURCHARGED
2880 minute winter	MH 11.0	2580	68.229	0.118	1.2	0.1332	0.0000	OK
8640 minute winter	RFO 04	5400	69.655	0.006	0.0	0.0001	0.0000	OK
2880 minute winter	MH 10.0	2580	68.229	0.161	1.2	0.1818	0.0000	OK
360 minute winter	ATT 09.1	320	68.563	0.214	2.0	11.1551	0.0000	SURCHARGED
360 minute winter	MH 09.1	320	68.563	0.269	0.5	0.3044	0.0000	SURCHARGED
2880 minute winter	MH 09.0	2580	68.229	0.280	1.5	0.4003	0.0000	OK
2880 minute winter	MH 08.0	2580	68.229	0.360	1.8	0.7141	0.0000	OK
2880 minute winter	ATT 07.0	2580	68.229	0.394	1.7	69.2010	0.0000	SURCHARGED
2880 minute winter	MH 07.0	2580	68.229	0.429	0.8	0.6135	0.0000	SURCHARGED
15 minute winter	MH 06.0	10	67.150	0.084	10.8	0.2240	0.0000	OK
15 minute winter	MH 05.0	11	67.131	0.080	10.5	0.1143	0.0000	OK
360 minute winter	ATT 04.2	344	69.284	0.135	2.6	14.7530	0.0000	OK
360 minute winter	MH 04.2	344	69.284	0.292	0.9	0.3298	0.0000	SURCHARGED
Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
240 minute winter	ATT 14.1	2.000	MH 14.1	2.3	0.425	0.156	0.1842	
240 minute winter	MH 14.1	2.001	MH 14.0	1.1	0.415	0.027	0.0060	
8640 minute winter	RFO 01	1.001	MH 14.0	0.0	0.202	0.003	0.0024	
240 minute winter	MH 14.0	1.002	MH 13.0	1.1	0.413	0.027	0.0442	
2880 minute winter	RFO 02	3.001	MH 13.0	0.0	0.200	0.002	0.0015	
240 minute winter	MH 13.0	1.003	MH 12.0	1.1	0.606	0.028	0.0229	
360 minute winter	ATT 12.1	5.000	MH 12.1	0.8	0.158	0.053	0.1585	
360 minute winter	MH 12.1	5.001	MH 12.0	0.3	0.627	0.010	0.0027	
2880 minute winter	RFO 03	4.001	MH 12.0	0.0	0.200	0.002	0.0019	
240 minute winter	MH 12.0	1.004	MH 11.0	1.5	1.485	0.007	0.0202	
360 minute winter	ATT 11.1	6.000	MH 11.1	0.8	0.161	0.052	0.1728	
360 minute winter	MH 11.1	6.001	MH 11.0	0.4	0.393	0.021	0.0019	
2880 minute winter	MH 11.0	1.005	MH 10.0	1.2	0.376	0.016	0.3309	
8640 minute winter	RFO 04	7.001	MH 10.0	0.0	0.203	0.003	0.0006	
2880 minute winter	MH 10.0	1.006	MH 09.0	1.2	0.392	0.017	0.4732	
360 minute winter	ATT 09.1	8.000	MH 09.1	0.5	0.148	0.035	0.1407	
360 minute winter	MH 09.1	8.001	MH 09.0	0.4	0.447	0.019	0.0077	
2880 minute winter	MH 09.0	1.007	MH 08.0	1.4	0.238	0.013	2.5285	
2880 minute winter	MH 08.0	1.008	ATT 07.0	1.7	0.409	0.016	1.2001	
2880 minute winter	ATT 07.0	1.009	MH 07.0	0.8	0.077	0.007	1.2389	
2880 minute winter	MH 07.0	1.010	MH 06.0	0.8	0.551	0.003	0.0508	
15 minute winter	MH 06.0	1.011	MH 05.0	10.5	0.537	0.065	0.1141	
15 minute winter	MH 05.0	1.012	MH 04.0	10.6	0.557	0.066	0.4162	
360 minute winter	ATT 04.2	9.000	MH 04.2	0.9	0.319	0.059	0.2045	
360 minute winter	MH 04.2	9.001	MH 04.1	0.4	0.438	0.010	0.0256	

Results for 2 year Critical Storm Duration. Lowest mass balance: 99.55%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
360 minute winter	MH 04.1	344	68.838	0.008	0.4	0.0095	0.0000	OK
240 minute winter	MH 04.0	184	67.098	0.101	3.3	0.1445	0.0000	OK
7200 minute winter	RFO 07	5280	70.050	0.006	0.0	0.0001	0.0000	OK
240 minute winter	MH 03.0	184	67.098	0.153	3.3	0.2187	0.0000	OK
240 minute winter	ATT 02.0	184	67.098	0.260	5.9	16.4142	0.0000	OK
240 minute winter	MH 02.0	184	67.098	0.285	2.3	0.5033	0.0000	OK
240 minute winter	ATT 64.0	196	71.399	0.103	1.5	4.4483	0.0000	OK
240 minute winter	MH 64.0	196	71.399	0.183	0.7	0.2068	0.0000	SURCHARGED
360 minute winter	ATT 63.0	288	71.290	0.233	1.5	6.7778	0.0000	SURCHARGED
360 minute winter	MH 63.0	288	71.290	0.331	1.2	0.3743	0.0000	SURCHARGED
360 minute winter	ATT 62.0	344	70.759	0.198	4.0	13.1855	0.0000	OK
360 minute winter	MH 62.0	344	70.759	0.321	2.1	0.3629	0.0000	SURCHARGED
360 minute winter	MH 61.0	344	70.342	0.021	0.8	0.0233	0.0000	OK
360 minute winter	MH 60.0	344	70.245	0.013	0.8	0.0143	0.0000	OK
120 minute winter	ATT 41.0	88	70.728	0.129	4.0	5.6405	0.0000	OK
120 minute winter	MH 41.0	88	70.728	0.165	2.4	0.1862	0.0000	SURCHARGED
120 minute winter	MH 40.0	88	70.530	0.019	1.5	0.0210	0.0000	OK
120 minute winter	ATT 51.0	86	71.069	0.123	4.4	5.8771	0.0000	OK
120 minute winter	MH 51.0	86	71.068	0.167	3.4	0.1890	0.0000	SURCHARGED
7200 minute winter	RFO 05	5280	71.405	0.006	0.0	0.0001	0.0000	OK
120 minute winter	MH 50.0	86	70.829	0.018	1.8	0.0208	0.0000	OK
360 minute winter	ATT 30.0	352	68.712	0.212	5.0	33.8395	0.0000	OK
360 minute winter	MH 30.0	352	68.712	0.290	1.9	0.4148	0.0000	OK
720 minute winter	RFO 06	675	70.736	0.006	0.0	0.0001	0.0000	OK
180 minute winter	ATT 21.0	128	68.566	0.139	3.5	6.6440	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
360 minute winter	MH 04.1	9.002	MH 04.0	0.4	0.863	0.002	0.0077	
240 minute winter	MH 04.0	1.013	MH 03.0	3.3	0.399	0.021	0.7830	
7200 minute winter	RFO 07	10.001	MH 03.0	0.0	0.203	0.003	0.0012	
240 minute winter	MH 03.0	1.014	ATT 02.0	3.1	0.427	0.019	0.7036	
240 minute winter	ATT 02.0	1.015	MH 02.0	2.3	0.145	0.011	1.3561	
240 minute winter	MH 02.0	1.016	MH 01.0	2.3	0.232	0.011	0.2357	
240 minute winter	ATT 64.0	11.000	MH 64.0	0.7	0.164	0.051	0.1770	
240 minute winter	MH 64.0	11.001	ATT 63.0	0.3	0.173	0.016	0.2083	
360 minute winter	ATT 63.0	11.002	MH 63.0	1.2	0.169	0.066	0.1726	
360 minute winter	MH 63.0	11.003	ATT 62.0	0.5	0.398	0.026	0.2685	
360 minute winter	ATT 62.0	11.004	MH 62.0	2.1	0.161	0.040	0.4743	
360 minute winter	MH 62.0	11.005	MH 61.0	0.8	0.453	0.015	0.0201	
360 minute winter	MH 61.0	11.006	MH 60.0	0.8	0.591	0.015	0.0119	
360 minute winter	MH 60.0	11.007	ATT 30.0	0.8	0.876	0.006	0.1284	
120 minute winter	ATT 41.0	12.000	MH 41.0	2.4	0.260	0.160	0.0875	
120 minute winter	MH 41.0	12.001	MH 40.0	1.5	0.764	0.083	0.0102	
120 minute winter	MH 40.0	12.002	ATT 30.0	1.5	1.182	0.032	0.0341	
120 minute winter	ATT 51.0	13.000	MH 51.0	3.4	0.330	0.228	0.1074	
120 minute winter	MH 51.0	13.001	MH 50.0	1.8	0.849	0.102	0.0198	
7200 minute winter	RFO 05	14.001	MH 50.0	0.0	0.202	0.003	0.0019	
120 minute winter	MH 50.0	13.002	ATT 30.0	1.8	1.498	0.031	0.0238	
360 minute winter	ATT 30.0	11.008	MH 30.0	1.9	0.139	0.017	1.9679	
360 minute winter	MH 30.0	11.009	MH 01.1	1.9	0.751	0.008	0.0892	
720 minute winter	RFO 06	15.001	MH 20.0	0.0	0.202	0.002	0.0021	
180 minute winter	ATT 21.0	16.000	MH 21.0	2.9	0.349	0.197	0.0944	

Results for 2 year Critical Storm Duration. Lowest mass balance: 99.55%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
180 minute winter	MH 21.0	128	68.565	0.176	2.9	0.1993	0.0000	SURCHARGED
180 minute winter	MH 20.0	128	68.314	0.031	1.6	0.0345	0.0000	OK
15 minute winter	MH 01.1	10	68.041	0.043	12.8	0.1283	0.0000	OK
15 minute winter	MH 01.0	12	66.920	0.131	12.6	0.1486	0.0000	OK
15 minute winter	HEADWALL	12	63.252	0.027	11.5	0.0000	0.0000	OK
8640 minute winter	BGR 01	5400	89.194	0.037	0.1	9.0844	0.0000	OK
2880 minute winter	BGR 02	1980	89.178	0.021	0.1	4.9241	0.0000	OK
2880 minute winter	BR 03	1980	86.022	0.023	0.1	4.8904	0.0000	OK
8640 minute winter	BGR 04	5400	86.035	0.036	0.1	9.1560	0.0000	OK
7200 minute winter	BGR 05	5280	91.286	0.033	0.2	19.3615	0.0000	OK
720 minute winter	BGR 06	675	90.402	0.022	0.3	4.7870	0.0000	OK
7200 minute winter	BGR 07	5280	89.667	0.033	0.2	19.1194	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
180 minute winter	MH 21.0	16.001	MH 20.0	1.5	0.594	0.086	0.0078	
180 minute winter	MH 20.0	15.002	MH 01.1	1.6	0.487	0.039	0.0726	
15 minute winter	MH 01.1	11.010	MH 01.0	12.6	1.848	0.027	0.1297	
15 minute winter	MH 01.0	1.017	HEADWALL	11.5	2.759	0.005	0.0708	46.0
8640 minute winter	BGR 01	1.000	RFO 01	0.0	0.088	0.003	0.0055	
2880 minute winter	BGR 02	3.000	RFO 02	0.0	0.090	0.002	0.0017	
2880 minute winter	BR 03	4.000	RFO 03	0.0	0.077	0.002	0.0045	
8640 minute winter	BGR 04	7.000	RFO 04	0.0	0.086	0.002	0.0062	
7200 minute winter	BGR 05	14.000	RFO 05	0.0	0.096	0.002	0.0029	
720 minute winter	BGR 06	15.000	RFO 06	0.0	0.083	0.002	0.0047	
7200 minute winter	BGR 07	10.000	RFO 07	0.0	0.108	0.002	0.0014	

Results for 30 year +40% CC Critical Storm Duration. Lowest mass balance: 99.55%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
240 minute winter	ATT 14.1	232	72.198	0.541	12.9	55.8862	0.0000	SURCHARGED
240 minute winter	MH 14.1	232	72.196	0.690	2.4	0.7807	0.0000	SURCHARGED
4320 minute winter	RFO 01	3960	72.565	0.008	0.1	0.0001	0.0000	OK
240 minute winter	MH 14.0	232	71.525	0.033	1.8	0.0369	0.0000	OK
2160 minute winter	RFO 02	2040	72.564	0.007	0.1	0.0001	0.0000	OK
240 minute winter	MH 13.0	236	71.429	0.036	1.9	0.0403	0.0000	OK
480 minute winter	ATT 12.1	464	72.231	0.574	5.0	44.7204	0.0000	SURCHARGED
480 minute winter	MH 12.1	464	72.231	0.636	0.8	0.7191	0.0000	SURCHARGED
2160 minute winter	RFO 03	2040	73.314	0.007	0.1	0.0001	0.0000	OK
240 minute winter	MH 12.0	232	71.340	0.018	2.5	0.0200	0.0000	OK
360 minute winter	ATT 11.1	352	68.947	0.598	5.5	36.7675	0.0000	SURCHARGED
360 minute winter	MH 11.1	352	68.947	0.666	0.9	0.7531	0.0000	SURCHARGED
2880 minute winter	MH 11.0	2820	68.902	0.791	2.1	0.8948	0.0000	SURCHARGED
4320 minute winter	RFO 04	3960	69.657	0.008	0.1	0.0001	0.0000	OK
2880 minute winter	MH 10.0	2820	68.904	0.836	2.2	0.9450	0.0000	SURCHARGED
360 minute winter	ATT 09.1	352	69.171	0.822	6.3	42.8171	0.0000	SURCHARGED
360 minute winter	MH 09.1	352	69.171	0.877	0.8	0.9919	0.0000	SURCHARGED
2880 minute winter	MH 09.0	2820	68.901	0.952	2.6	1.3625	0.0000	SURCHARGED
2880 minute winter	MH 08.0	2820	68.901	1.032	3.4	2.0480	0.0000	SURCHARGED
2880 minute winter	ATT 07.0	2820	68.900	1.065	3.4	187.1698	0.0000	SURCHARGED
2880 minute winter	MH 07.0	2820	68.900	1.100	1.3	1.5740	0.0000	SURCHARGED
240 minute winter	MH 06.0	228	67.745	0.679	9.1	1.8088	0.0000	SURCHARGED
240 minute winter	MH 05.0	228	67.745	0.694	7.5	0.9938	0.0000	SURCHARGED
480 minute winter	ATT 04.2	464	69.676	0.527	6.2	57.7065	0.0000	SURCHARGED
480 minute winter	MH 04.2	464	69.675	0.683	1.0	0.7730	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
240 minute winter	ATT 14.1	2.000	MH 14.1	2.4	0.435	0.164	0.1951	
240 minute winter	MH 14.1	2.001	MH 14.0	1.7	0.470	0.043	0.0086	
4320 minute winter	RFO 01	1.001	MH 14.0	0.1	0.229	0.005	0.0038	
240 minute winter	MH 14.0	1.002	MH 13.0	1.8	0.478	0.045	0.0631	
2160 minute winter	RFO 02	3.001	MH 13.0	0.1	0.212	0.004	0.0030	
240 minute winter	MH 13.0	1.003	MH 12.0	1.9	0.709	0.047	0.0328	
480 minute winter	ATT 12.1	5.000	MH 12.1	0.8	0.190	0.051	0.1585	
480 minute winter	MH 12.1	5.001	MH 12.0	0.6	0.744	0.017	0.0040	
2160 minute winter	RFO 03	4.001	MH 12.0	0.1	0.216	0.005	0.0040	
240 minute winter	MH 12.0	1.004	MH 11.0	2.5	1.752	0.012	0.4223	
360 minute winter	ATT 11.1	6.000	MH 11.1	0.9	0.195	0.059	0.1729	
360 minute winter	MH 11.1	6.001	MH 11.0	0.7	0.463	0.038	0.0349	
2880 minute winter	MH 11.0	1.005	MH 10.0	2.1	0.399	0.030	0.7273	
4320 minute winter	RFO 04	7.001	MH 10.0	0.1	0.228	0.005	0.0010	
2880 minute winter	MH 10.0	1.006	MH 09.0	2.2	0.393	0.031	0.7433	
360 minute winter	ATT 09.1	8.000	MH 09.1	0.8	0.183	0.055	0.1407	
360 minute winter	MH 09.1	8.001	MH 09.0	0.7	0.530	0.034	0.1590	
2880 minute winter	MH 09.0	1.007	MH 08.0	2.5	0.285	0.023	2.8324	
2880 minute winter	MH 08.0	1.008	ATT 07.0	3.4	0.420	0.031	1.2086	
2880 minute winter	ATT 07.0	1.009	MH 07.0	1.3	0.081	0.011	1.2389	
2880 minute winter	MH 07.0	1.010	MH 06.0	1.3	0.629	0.005	0.8311	
240 minute winter	MH 06.0	1.011	MH 05.0	7.5	0.465	0.046	0.9212	
240 minute winter	MH 05.0	1.012	MH 04.0	6.4	0.432	0.040	3.4637	
480 minute winter	ATT 04.2	9.000	MH 04.2	1.0	0.328	0.071	0.2101	
480 minute winter	MH 04.2	9.001	MH 04.1	0.6	0.505	0.015	0.0347	

Results for 30 year +40% CC Critical Storm Duration. Lowest mass balance: 99.55%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
480 minute winter	MH 04.1	472	68.840	0.010	0.6	0.0116	0.0000	OK
240 minute winter	MH 04.0	228	67.745	0.748	6.8	1.0710	0.0000	SURCHARGED
10080 minute winter	RFO 07	9480	70.052	0.008	0.1	0.0002	0.0000	OK
240 minute winter	MH 03.0	228	67.745	0.800	6.4	1.1454	0.0000	SURCHARGED
240 minute winter	ATT 02.0	228	67.745	0.907	14.5	57.3255	0.0000	SURCHARGED
240 minute winter	MH 02.0	228	67.745	0.932	4.4	1.6476	0.0000	SURCHARGED
600 minute winter	ATT 64.0	585	71.872	0.576	2.1	24.8861	0.0000	SURCHARGED
600 minute winter	MH 64.0	585	71.872	0.656	0.8	0.7415	0.0000	SURCHARGED
360 minute winter	ATT 63.0	344	71.841	0.784	3.9	22.8125	0.0000	SURCHARGED
360 minute winter	MH 63.0	344	71.841	0.882	1.0	0.9976	0.0000	SURCHARGED
480 minute winter	ATT 62.0	464	71.306	0.745	6.2	49.6086	0.0000	SURCHARGED
480 minute winter	MH 62.0	464	71.306	0.868	2.9	0.9812	0.0000	SURCHARGED
480 minute winter	MH 61.0	464	70.347	0.026	1.3	0.0298	0.0000	OK
480 minute winter	MH 60.0	464	70.248	0.016	1.3	0.0182	0.0000	OK
120 minute winter	ATT 41.0	96	71.205	0.606	14.1	26.4853	0.0000	SURCHARGED
120 minute winter	MH 41.0	96	71.203	0.640	3.1	0.7235	0.0000	SURCHARGED
120 minute winter	MH 40.0	96	70.538	0.027	3.1	0.0301	0.0000	OK
120 minute winter	ATT 51.0	94	71.544	0.598	15.9	28.6559	0.0000	SURCHARGED
120 minute winter	MH 51.0	94	71.540	0.639	3.9	0.7233	0.0000	SURCHARGED
10080 minute winter	RFO 05	9480	71.407	0.008	0.1	0.0001	0.0000	OK
120 minute winter	MH 50.0	94	70.837	0.026	3.9	0.0297	0.0000	OK
600 minute winter	ATT 30.0	630	69.273	0.773	9.6	123.4362	0.0000	SURCHARGED
600 minute winter	MH 30.0	630	69.273	0.851	3.3	1.2175	0.0000	SURCHARGED
720 minute winter	RFO 06	705	70.738	0.008	0.1	0.0002	0.0000	OK
180 minute winter	ATT 21.0	136	69.071	0.644	11.9	30.8427	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
480 minute winter	MH 04.1	9.002	MH 04.0	0.6	0.886	0.004	0.3386	
240 minute winter	MH 04.0	1.013	MH 03.0	6.3	0.404	0.040	3.3563	
10080 minute winter	RFO 07	10.001	MH 03.0	0.1	0.233	0.006	0.0020	
240 minute winter	MH 03.0	1.014	ATT 02.0	6.2	0.419	0.039	2.0509	
240 minute winter	ATT 02.0	1.015	MH 02.0	4.4	0.208	0.020	2.5915	
240 minute winter	MH 02.0	1.016	MH 01.0	4.4	0.183	0.020	0.7055	
600 minute winter	ATT 64.0	11.000	MH 64.0	0.8	0.135	0.051	0.2044	
600 minute winter	MH 64.0	11.001	ATT 63.0	0.3	0.169	0.017	0.2817	
360 minute winter	ATT 63.0	11.002	MH 63.0	1.0	0.191	0.058	0.1726	
360 minute winter	MH 63.0	11.003	ATT 62.0	0.6	0.400	0.035	0.5721	
480 minute winter	ATT 62.0	11.004	MH 62.0	2.9	0.196	0.055	0.4914	
480 minute winter	MH 62.0	11.005	MH 61.0	1.3	0.526	0.025	0.0289	
480 minute winter	MH 61.0	11.006	MH 60.0	1.3	0.689	0.025	0.0170	
480 minute winter	MH 60.0	11.007	ATT 30.0	1.3	0.885	0.010	0.5414	
120 minute winter	ATT 41.0	12.000	MH 41.0	3.1	0.328	0.213	0.0914	
120 minute winter	MH 41.0	12.001	MH 40.0	3.1	0.948	0.175	0.0174	
120 minute winter	MH 40.0	12.002	ATT 30.0	3.1	1.464	0.068	0.2684	
120 minute winter	ATT 51.0	13.000	MH 51.0	3.9	0.361	0.262	0.1145	
120 minute winter	MH 51.0	13.001	MH 50.0	3.8	1.052	0.216	0.0337	
10080 minute winter	RFO 05	14.001	MH 50.0	0.1	0.232	0.006	0.0033	
120 minute winter	MH 50.0	13.002	ATT 30.0	3.9	1.861	0.066	0.1910	
600 minute winter	ATT 30.0	11.008	MH 30.0	3.3	0.154	0.030	2.7900	
600 minute winter	MH 30.0	11.009	MH 01.1	3.3	0.894	0.014	0.1322	
720 minute winter	RFO 06	15.001	MH 20.0	0.1	0.233	0.006	0.0041	
180 minute winter	ATT 21.0	16.000	MH 21.0	3.2	0.321	0.218	0.0960	

Results for 30 year +40% CC Critical Storm Duration. Lowest mass balance: 99.55%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
180 minute winter	MH 21.0	136	69.069	0.680	3.2	0.7685	0.0000	SURCHARGED
180 minute winter	MH 20.0	140	68.327	0.044	3.3	0.0500	0.0000	OK
15 minute winter	MH 01.1	10	68.081	0.083	52.4	0.2486	0.0000	OK
15 minute winter	MH 01.0	12	67.216	0.427	51.9	0.4832	0.0000	OK
15 minute summer	HEADWALL	10	63.274	0.049	42.0	0.0000	0.0000	OK
4320 minute winter	BGR 01	3960	89.247	0.090	0.3	22.1169	0.0000	OK
2160 minute winter	BGR 02	2040	89.217	0.060	0.3	14.3037	0.0000	OK
2160 minute winter	BR 03	2040	86.066	0.067	0.3	14.1034	0.0000	OK
4320 minute winter	BGR 04	3960	86.088	0.089	0.3	22.2676	0.0000	OK
10080 minute winter	BGR 05	9480	91.347	0.094	0.3	56.1811	0.0000	OK
720 minute winter	BGR 06	705	90.442	0.062	0.9	13.5547	0.0000	OK
10080 minute winter	BGR 07	9480	89.729	0.095	0.3	55.5710	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
180 minute winter	MH 21.0	16.001	MH 20.0	3.2	0.723	0.179	0.0135	
180 minute winter	MH 20.0	15.002	MH 01.1	3.3	0.606	0.082	0.1236	
15 minute winter	MH 01.1	11.010	MH 01.0	51.9	2.293	0.110	0.9866	
15 minute winter	MH 01.0	1.017	HEADWALL	42.0	4.078	0.019	0.1744	113.7
4320 minute winter	BGR 01	1.000	RFO 01	0.1	0.110	0.005	0.0079	
2160 minute winter	BGR 02	3.000	RFO 02	0.1	0.114	0.004	0.0029	
2160 minute winter	BR 03	4.000	RFO 03	0.1	0.100	0.004	0.0074	
4320 minute winter	BGR 04	7.000	RFO 04	0.1	0.107	0.005	0.0088	
10080 minute winter	BGR 05	14.000	RFO 05	0.1	0.122	0.005	0.0044	
720 minute winter	BGR 06	15.000	RFO 06	0.1	0.112	0.005	0.0079	
10080 minute winter	BGR 07	10.000	RFO 07	0.1	0.136	0.005	0.0022	

Results for 100 year Critical Storm Duration. Lowest mass balance: 99.55%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
240 minute winter	ATT 14.1	232	72.163	0.506	12.2	52.2926	0.0000	SURCHARGED
240 minute winter	MH 14.1	232	72.162	0.656	2.6	0.7415	0.0000	SURCHARGED
2160 minute winter	RFO 01	2100	72.565	0.008	0.1	0.0001	0.0000	OK
240 minute winter	MH 14.0	232	71.524	0.032	1.8	0.0364	0.0000	OK
1440 minute winter	RFO 02	1380	72.564	0.007	0.1	0.0001	0.0000	OK
240 minute winter	MH 13.0	232	71.428	0.035	1.8	0.0397	0.0000	OK
480 minute winter	ATT 12.1	464	72.203	0.546	4.8	42.5255	0.0000	SURCHARGED
480 minute winter	MH 12.1	464	72.203	0.608	0.8	0.6872	0.0000	SURCHARGED
1440 minute winter	RFO 03	1380	73.314	0.007	0.1	0.0001	0.0000	OK
240 minute winter	MH 12.0	236	71.339	0.017	2.4	0.0198	0.0000	OK
360 minute winter	ATT 11.1	344	68.913	0.564	5.3	34.6635	0.0000	SURCHARGED
360 minute winter	MH 11.1	344	68.913	0.632	0.9	0.7144	0.0000	SURCHARGED
2160 minute winter	MH 11.0	2160	68.852	0.741	2.3	0.8376	0.0000	SURCHARGED
2160 minute winter	RFO 04	2100	69.657	0.008	0.1	0.0001	0.0000	OK
2160 minute winter	MH 10.0	2160	68.851	0.783	2.4	0.8856	0.0000	SURCHARGED
360 minute winter	ATT 09.1	352	69.132	0.783	6.0	40.7966	0.0000	SURCHARGED
360 minute winter	MH 09.1	352	69.132	0.838	0.7	0.9480	0.0000	SURCHARGED
2160 minute winter	MH 09.0	2160	68.851	0.902	2.8	1.2909	0.0000	SURCHARGED
2160 minute winter	MH 08.0	2160	68.850	0.981	3.7	1.9482	0.0000	SURCHARGED
2160 minute winter	ATT 07.0	2160	68.848	1.013	3.7	177.9799	0.0000	SURCHARGED
2160 minute winter	MH 07.0	2160	68.848	1.048	1.2	1.4992	0.0000	SURCHARGED
360 minute winter	MH 06.0	280	67.684	0.618	6.6	1.6448	0.0000	SURCHARGED
360 minute winter	MH 05.0	280	67.684	0.633	5.5	0.9057	0.0000	SURCHARGED
480 minute winter	ATT 04.2	464	69.654	0.505	6.0	55.3419	0.0000	SURCHARGED
480 minute winter	MH 04.2	464	69.654	0.662	0.7	0.7486	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
240 minute winter	ATT 14.1	2.000	MH 14.1	2.6	0.422	0.174	0.1951	
240 minute winter	MH 14.1	2.001	MH 14.0	1.7	0.467	0.042	0.0085	
2160 minute winter	RFO 01	1.001	MH 14.0	0.1	0.227	0.005	0.0038	
240 minute winter	MH 14.0	1.002	MH 13.0	1.8	0.474	0.044	0.0619	
1440 minute winter	RFO 02	3.001	MH 13.0	0.1	0.210	0.004	0.0029	
240 minute winter	MH 13.0	1.003	MH 12.0	1.8	0.702	0.045	0.0321	
480 minute winter	ATT 12.1	5.000	MH 12.1	0.8	0.190	0.052	0.1585	
480 minute winter	MH 12.1	5.001	MH 12.0	0.6	0.739	0.016	0.0040	
1440 minute winter	RFO 03	4.001	MH 12.0	0.1	0.214	0.004	0.0039	
240 minute winter	MH 12.0	1.004	MH 11.0	2.4	1.737	0.012	0.4110	
360 minute winter	ATT 11.1	6.000	MH 11.1	0.9	0.206	0.061	0.1729	
360 minute winter	MH 11.1	6.001	MH 11.0	0.8	0.460	0.043	0.0349	
2160 minute winter	MH 11.0	1.005	MH 10.0	2.3	0.404	0.032	0.7273	
2160 minute winter	RFO 04	7.001	MH 10.0	0.1	0.226	0.005	0.0010	
2160 minute winter	MH 10.0	1.006	MH 09.0	2.3	0.416	0.032	0.7433	
360 minute winter	ATT 09.1	8.000	MH 09.1	0.7	0.183	0.047	0.1407	
360 minute winter	MH 09.1	8.001	MH 09.0	0.7	0.528	0.033	0.1590	
2160 minute winter	MH 09.0	1.007	MH 08.0	2.8	0.295	0.025	2.8324	
2160 minute winter	MH 08.0	1.008	ATT 07.0	3.7	0.434	0.033	1.2086	
2160 minute winter	ATT 07.0	1.009	MH 07.0	1.2	0.085	0.011	1.2389	
2160 minute winter	MH 07.0	1.010	MH 06.0	1.2	0.625	0.005	1.0570	
360 minute winter	MH 06.0	1.011	MH 05.0	5.5	0.423	0.034	0.9212	
360 minute winter	MH 05.0	1.012	MH 04.0	4.7	0.382	0.030	3.4637	
480 minute winter	ATT 04.2	9.000	MH 04.2	0.7	0.326	0.047	0.2101	
480 minute winter	MH 04.2	9.001	MH 04.1	0.6	0.502	0.015	0.0343	

Results for 100 year Critical Storm Duration. Lowest mass balance: 99.55%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
480 minute winter	MH 04.1	472	68.840	0.010	0.6	0.0115	0.0000	OK
360 minute winter	MH 04.0	280	67.684	0.687	5.2	0.9829	0.0000	SURCHARGED
8640 minute winter	RFO 07	7980	70.052	0.008	0.1	0.0001	0.0000	OK
360 minute winter	MH 03.0	280	67.684	0.739	4.9	1.0573	0.0000	SURCHARGED
360 minute winter	ATT 02.0	280	67.684	0.846	10.4	53.4364	0.0000	SURCHARGED
360 minute winter	MH 02.0	280	67.684	0.871	4.2	1.5388	0.0000	SURCHARGED
600 minute winter	ATT 64.0	585	71.840	0.544	2.0	23.5110	0.0000	SURCHARGED
600 minute winter	MH 64.0	585	71.840	0.624	0.7	0.7055	0.0000	SURCHARGED
360 minute winter	ATT 63.0	344	71.806	0.749	3.8	21.7773	0.0000	SURCHARGED
360 minute winter	MH 63.0	344	71.805	0.846	1.3	0.9573	0.0000	SURCHARGED
480 minute winter	ATT 62.0	464	71.270	0.709	6.0	47.2633	0.0000	SURCHARGED
480 minute winter	MH 62.0	464	71.270	0.832	2.8	0.9414	0.0000	SURCHARGED
480 minute winter	MH 61.0	464	70.347	0.026	1.3	0.0295	0.0000	OK
480 minute winter	MH 60.0	464	70.248	0.016	1.3	0.0180	0.0000	OK
120 minute winter	ATT 41.0	96	71.157	0.558	13.1	24.4116	0.0000	SURCHARGED
120 minute winter	MH 41.0	96	71.155	0.592	3.0	0.6700	0.0000	SURCHARGED
120 minute winter	MH 40.0	96	70.537	0.026	3.0	0.0295	0.0000	OK
120 minute winter	ATT 51.0	94	71.497	0.551	14.8	26.4083	0.0000	SURCHARGED
120 minute winter	MH 51.0	94	71.494	0.593	3.7	0.6705	0.0000	SURCHARGED
8640 minute winter	RFO 05	7980	71.407	0.008	0.1	0.0001	0.0000	OK
120 minute winter	MH 50.0	86	70.837	0.026	3.7	0.0292	0.0000	OK
600 minute winter	ATT 30.0	630	69.243	0.743	9.4	118.7201	0.0000	SURCHARGED
600 minute winter	MH 30.0	630	69.243	0.821	3.3	1.1752	0.0000	SURCHARGED
720 minute winter	RFO 06	705	70.738	0.008	0.1	0.0001	0.0000	OK
180 minute winter	ATT 21.0	136	69.022	0.595	11.2	28.5182	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
480 minute winter	MH 04.1	9.002	MH 04.0	0.6	0.883	0.004	0.3385	
360 minute winter	MH 04.0	1.013	MH 03.0	4.8	0.371	0.030	3.3563	
8640 minute winter	RFO 07	10.001	MH 03.0	0.1	0.226	0.005	0.0019	
360 minute winter	MH 03.0	1.014	ATT 02.0	4.7	0.395	0.030	2.0509	
360 minute winter	ATT 02.0	1.015	MH 02.0	4.2	0.168	0.019	2.5915	
360 minute winter	MH 02.0	1.016	MH 01.0	4.2	0.194	0.019	0.5631	
600 minute winter	ATT 64.0	11.000	MH 64.0	0.7	0.135	0.049	0.2044	
600 minute winter	MH 64.0	11.001	ATT 63.0	0.3	0.162	0.016	0.2817	
360 minute winter	ATT 63.0	11.002	MH 63.0	1.3	0.183	0.073	0.1726	
360 minute winter	MH 63.0	11.003	ATT 62.0	0.6	0.399	0.035	0.5721	
480 minute winter	ATT 62.0	11.004	MH 62.0	2.8	0.207	0.054	0.4914	
480 minute winter	MH 62.0	11.005	MH 61.0	1.3	0.523	0.024	0.0285	
480 minute winter	MH 61.0	11.006	MH 60.0	1.3	0.685	0.024	0.0168	
480 minute winter	MH 60.0	11.007	ATT 30.0	1.3	0.880	0.010	0.5412	
120 minute winter	ATT 41.0	12.000	MH 41.0	3.0	0.355	0.204	0.0914	
120 minute winter	MH 41.0	12.001	MH 40.0	3.0	0.937	0.168	0.0169	
120 minute winter	MH 40.0	12.002	ATT 30.0	3.0	1.451	0.065	0.2668	
120 minute winter	ATT 51.0	13.000	MH 51.0	3.7	0.341	0.252	0.1145	
120 minute winter	MH 51.0	13.001	MH 50.0	3.7	1.040	0.208	0.0328	
8640 minute winter	RFO 05	14.001	MH 50.0	0.1	0.225	0.005	0.0031	
120 minute winter	MH 50.0	13.002	ATT 30.0	3.7	1.844	0.064	0.1898	
600 minute winter	ATT 30.0	11.008	MH 30.0	3.3	0.159	0.030	2.7900	
600 minute winter	MH 30.0	11.009	MH 01.1	3.3	0.890	0.014	0.1304	
720 minute winter	RFO 06	15.001	MH 20.0	0.1	0.231	0.006	0.0041	
180 minute winter	ATT 21.0	16.000	MH 21.0	3.1	0.362	0.210	0.0960	

Results for 100 year Critical Storm Duration. Lowest mass balance: 99.55%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
180 minute winter	MH 21.0	136	69.020	0.631	3.1	0.7138	0.0000	SURCHARGED
180 minute winter	MH 20.0	140	68.326	0.043	3.2	0.0490	0.0000	OK
15 minute winter	MH 01.1	10	68.078	0.080	48.7	0.2396	0.0000	OK
15 minute winter	MH 01.0	12	67.162	0.373	48.2	0.4218	0.0000	OK
15 minute winter	HEADWALL	10	63.274	0.049	42.0	0.0000	0.0000	OK
2160 minute winter	BGR 01	2100	89.242	0.085	0.5	20.9860	0.0000	OK
1440 minute winter	BGR 02	1380	89.214	0.057	0.5	13.7361	0.0000	OK
1440 minute winter	BR 03	1380	86.063	0.064	0.5	13.6002	0.0000	OK
2160 minute winter	BGR 04	2100	86.083	0.084	0.5	21.0714	0.0000	OK
8640 minute winter	BGR 05	7980	91.333	0.080	0.3	47.6069	0.0000	OK
720 minute winter	BGR 06	705	90.439	0.059	0.9	13.0672	0.0000	OK
8640 minute winter	BGR 07	7980	89.714	0.080	0.3	47.0947	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
180 minute winter	MH 21.0	16.001	MH 20.0	3.1	0.716	0.172	0.0131	
180 minute winter	MH 20.0	15.002	MH 01.1	3.2	0.599	0.079	0.1202	
15 minute winter	MH 01.1	11.010	MH 01.0	48.2	2.245	0.102	0.7969	
15 minute winter	MH 01.0	1.017	HEADWALL	42.0	4.078	0.019	0.1744	108.4
2160 minute winter	BGR 01	1.000	RFO 01	0.1	0.108	0.004	0.0077	
1440 minute winter	BGR 02	3.000	RFO 02	0.1	0.112	0.004	0.0029	
1440 minute winter	BR 03	4.000	RFO 03	0.1	0.099	0.004	0.0073	
2160 minute winter	BGR 04	7.000	RFO 04	0.1	0.106	0.004	0.0086	
8640 minute winter	BGR 05	14.000	RFO 05	0.1	0.117	0.004	0.0042	
720 minute winter	BGR 06	15.000	RFO 06	0.1	0.111	0.005	0.0078	
8640 minute winter	BGR 07	10.000	RFO 07	0.1	0.131	0.004	0.0021	

Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 99.55%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
360 minute winter	ATT 14.1	336	72.408	0.751	12.7	77.6777	0.0000	SURCHARGED
360 minute winter	MH 14.1	336	72.407	0.901	2.0	1.0186	0.0000	SURCHARGED
1440 minute winter	RFO 01	1410	72.566	0.009	0.1	0.0002	0.0000	OK
360 minute winter	MH 14.0	344	71.527	0.035	2.1	0.0396	0.0000	OK
960 minute winter	RFO 02	945	72.565	0.008	0.1	0.0001	0.0000	OK
360 minute winter	MH 13.0	344	71.431	0.038	2.1	0.0431	0.0000	OK
480 minute winter	ATT 12.1	464	72.456	0.799	6.7	62.2865	0.0000	SURCHARGED
480 minute winter	MH 12.1	464	72.456	0.861	0.8	0.9740	0.0000	SURCHARGED
960 minute winter	RFO 03	945	73.315	0.008	0.1	0.0001	0.0000	OK
360 minute winter	MH 12.0	344	71.341	0.019	2.9	0.0213	0.0000	OK
2160 minute winter	ATT 11.1	2100	69.966	1.617	1.6	49.7750	0.0000	SURCHARGED
2160 minute winter	MH 11.1	2100	69.966	1.685	0.8	1.9061	0.0000	SURCHARGED
2160 minute winter	MH 11.0	2280	69.943	1.832	2.8	2.0720	0.0000	SURCHARGED
2160 minute winter	RFO 04	2280	69.943	0.294	0.3	0.0053	0.0000	SURCHARGED
2160 minute winter	MH 10.0	2280	69.943	1.875	2.8	2.1203	0.0000	SURCHARGED
2160 minute winter	ATT 09.1	2280	69.943	1.594	1.8	62.8291	0.0000	SURCHARGED
2160 minute winter	MH 09.1	2280	69.943	1.649	0.6	1.8652	0.0000	SURCHARGED
2160 minute winter	MH 09.0	2280	69.943	1.994	3.3	2.8535	0.0000	SURCHARGED
2160 minute winter	MH 08.0	2280	69.944	2.075	4.6	4.1188	0.0000	SURCHARGED
2160 minute winter	ATT 07.0	2280	69.942	2.107	4.6	210.9879	0.0000	SURCHARGED
2160 minute winter	MH 07.0	2280	69.944	2.144	1.9	3.0681	0.0000	FLOOD RISK
360 minute winter	MH 06.0	272	68.260	1.194	9.0	3.1786	0.0000	FLOOD RISK
360 minute winter	MH 05.0	272	68.260	1.209	7.9	1.7306	0.0000	FLOOD RISK
600 minute winter	ATT 04.2	585	69.886	0.737	6.9	80.7088	0.0000	SURCHARGED
600 minute winter	MH 04.2	585	69.885	0.893	0.8	1.0104	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
360 minute winter	ATT 14.1	2.000	MH 14.1	2.0	0.379	0.136	0.1951	
360 minute winter	MH 14.1	2.001	MH 14.0	2.0	0.486	0.050	0.0096	
1440 minute winter	RFO 01	1.001	MH 14.0	0.1	0.242	0.007	0.0043	
360 minute winter	MH 14.0	1.002	MH 13.0	2.1	0.497	0.052	0.0698	
960 minute winter	RFO 02	3.001	MH 13.0	0.1	0.225	0.005	0.0034	
360 minute winter	MH 13.0	1.003	MH 12.0	2.1	0.740	0.054	0.0361	
480 minute winter	ATT 12.1	5.000	MH 12.1	0.8	0.201	0.055	0.1585	
480 minute winter	MH 12.1	5.001	MH 12.0	0.7	0.777	0.020	0.0045	
960 minute winter	RFO 03	4.001	MH 12.0	0.1	0.229	0.005	0.0045	
360 minute winter	MH 12.0	1.004	MH 11.0	2.9	1.785	0.014	0.4254	
2160 minute winter	ATT 11.1	6.000	MH 11.1	0.8	0.111	0.053	0.1729	
2160 minute winter	MH 11.1	6.001	MH 11.0	0.5	0.412	0.029	0.0349	
2160 minute winter	MH 11.0	1.005	MH 10.0	2.7	0.412	0.038	0.7273	
2160 minute winter	RFO 04	7.001	MH 10.0	0.2	0.238	0.012	0.0523	
2160 minute winter	MH 10.0	1.006	MH 09.0	2.8	0.414	0.039	0.7433	
2160 minute winter	ATT 09.1	8.000	MH 09.1	0.6	0.105	0.038	0.1407	
2160 minute winter	MH 09.1	8.001	MH 09.0	-0.5	0.460	-0.026	0.1590	
2160 minute winter	MH 09.0	1.007	MH 08.0	3.3	0.304	0.029	2.8324	
2160 minute winter	MH 08.0	1.008	ATT 07.0	4.6	0.444	0.041	1.2086	
2160 minute winter	ATT 07.0	1.009	MH 07.0	1.9	0.074	0.017	1.2389	
2160 minute winter	MH 07.0	1.010	MH 06.0	1.8	0.542	0.006	2.0297	
360 minute winter	MH 06.0	1.011	MH 05.0	7.9	0.425	0.048	0.9212	
360 minute winter	MH 05.0	1.012	MH 04.0	7.6	0.381	0.047	3.4637	
600 minute winter	ATT 04.2	9.000	MH 04.2	0.8	0.283	0.057	0.2101	
600 minute winter	MH 04.2	9.001	MH 04.1	0.7	0.526	0.018	0.0382	

Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 99.55%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
600 minute winter	MH 04.1	585	68.841	0.011	0.7	0.0123	0.0000	OK
360 minute winter	MH 04.0	272	68.262	1.265	8.1	1.8097	0.0000	SURCHARGED
10080 minute winter	RFO 07	9600	70.053	0.009	0.1	0.0002	0.0000	OK
360 minute winter	MH 03.0	272	68.262	1.317	7.7	1.8849	0.0000	SURCHARGED
360 minute winter	ATT 02.0	272	68.262	1.424	16.9	75.9465	0.0000	SURCHARGED
360 minute winter	MH 02.0	272	68.262	1.449	6.1	2.5612	0.0000	SURCHARGED
600 minute winter	ATT 64.0	570	72.473	1.177	2.9	34.7924	0.0000	SURCHARGED
600 minute winter	MH 64.0	570	72.473	1.257	0.8	1.4221	0.0000	SURCHARGED
600 minute winter	ATT 63.0	585	72.170	1.113	3.5	32.3724	0.0000	SURCHARGED
600 minute winter	MH 63.0	585	72.170	1.211	1.2	1.3692	0.0000	SURCHARGED
480 minute winter	ATT 62.0	464	71.584	1.023	8.0	68.1670	0.0000	SURCHARGED
480 minute winter	MH 62.0	464	71.584	1.146	3.0	1.2962	0.0000	SURCHARGED
480 minute winter	MH 61.0	464	70.349	0.028	1.5	0.0319	0.0000	OK
480 minute winter	MH 60.0	464	70.249	0.017	1.5	0.0194	0.0000	OK
180 minute winter	ATT 41.0	132	71.863	1.264	13.9	35.4472	0.0000	SURCHARGED
180 minute winter	MH 41.0	132	71.858	1.295	5.4	1.4648	0.0000	SURCHARGED
180 minute winter	MH 40.0	132	70.543	0.032	4.5	0.0360	0.0000	OK
180 minute winter	ATT 51.0	132	72.057	1.111	15.6	38.6058	0.0000	SURCHARGED
180 minute winter	MH 51.0	132	72.050	1.149	5.7	1.2994	0.0000	SURCHARGED
10080 minute winter	RFO 05	9600	71.408	0.009	0.1	0.0002	0.0000	OK
180 minute winter	MH 50.0	132	70.842	0.031	5.3	0.0345	0.0000	OK
720 minute winter	ATT 30.0	750	69.585	1.085	11.3	173.2198	0.0000	SURCHARGED
720 minute winter	MH 30.0	750	69.584	1.162	3.9	1.6635	0.0000	SURCHARGED
960 minute winter	RFO 06	915	70.739	0.009	0.1	0.0002	0.0000	OK
180 minute winter	ATT 21.0	140	69.317	0.890	15.6	42.6325	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
600 minute winter	MH 04.1	9.002	MH 04.0	0.7	0.884	0.004	0.3391	
360 minute winter	MH 04.0	1.013	MH 03.0	7.7	0.365	0.048	3.3563	
10080 minute winter	RFO 07	10.001	MH 03.0	0.1	0.240	0.006	0.0022	
360 minute winter	MH 03.0	1.014	ATT 02.0	7.4	0.406	0.046	2.0509	
360 minute winter	ATT 02.0	1.015	MH 02.0	6.1	0.204	0.028	2.5915	
360 minute winter	MH 02.0	1.016	MH 01.0	5.5	0.157	0.025	0.7742	
600 minute winter	ATT 64.0	11.000	MH 64.0	0.8	0.132	0.052	0.2044	
600 minute winter	MH 64.0	11.001	ATT 63.0	0.4	0.150	0.023	0.2817	
600 minute winter	ATT 63.0	11.002	MH 63.0	1.2	0.216	0.068	0.1726	
600 minute winter	MH 63.0	11.003	ATT 62.0	0.7	0.398	0.037	0.5721	
480 minute winter	ATT 62.0	11.004	MH 62.0	3.0	0.197	0.058	0.4914	
480 minute winter	MH 62.0	11.005	MH 61.0	1.5	0.547	0.029	0.0320	
480 minute winter	MH 61.0	11.006	MH 60.0	1.5	0.720	0.029	0.0188	
480 minute winter	MH 60.0	11.007	ATT 30.0	1.5	0.882	0.012	0.5431	
180 minute winter	ATT 41.0	12.000	MH 41.0	5.4	0.326	0.364	0.0914	
180 minute winter	MH 41.0	12.001	MH 40.0	4.5	1.052	0.253	0.0226	
180 minute winter	MH 40.0	12.002	ATT 30.0	4.5	1.447	0.098	0.2775	
180 minute winter	ATT 51.0	13.000	MH 51.0	5.7	0.325	0.388	0.1145	
180 minute winter	MH 51.0	13.001	MH 50.0	5.2	1.146	0.294	0.0420	
10080 minute winter	RFO 05	14.001	MH 50.0	0.1	0.239	0.006	0.0035	
180 minute winter	MH 50.0	13.002	ATT 30.0	5.3	1.839	0.090	0.1965	
720 minute winter	ATT 30.0	11.008	MH 30.0	3.9	0.159	0.035	2.7900	
720 minute winter	MH 30.0	11.009	MH 01.1	3.9	0.936	0.016	0.1481	
960 minute winter	RFO 06	15.001	MH 20.0	0.1	0.248	0.007	0.0048	
180 minute winter	ATT 21.0	16.000	MH 21.0	3.8	0.331	0.257	0.0960	

Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 99.55%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
180 minute winter	MH 21.0	140	69.314	0.925	3.8	1.0459	0.0000	SURCHARGED
180 minute winter	MH 20.0	140	68.331	0.048	3.9	0.0542	0.0000	OK
15 minute winter	MH 01.1	10	68.093	0.095	68.1	0.2837	0.0000	OK
15 minute winter	MH 01.0	13	67.974	1.185	67.6	1.3400	0.0000	SURCHARGED
30 minute summer	HEADWALL	16	63.274	0.049	42.0	0.0000	0.0000	OK
1440 minute winter	BGR 01	1410	89.278	0.121	1.0	29.8919	0.0000	OK
960 minute winter	BGR 02	945	89.238	0.081	0.9	19.3271	0.0000	OK
960 minute winter	BR 03	945	86.090	0.091	0.9	19.1989	0.0000	OK
1440 minute winter	BGR 04	1410	86.118	0.119	1.0	29.9590	0.0000	OK
10080 minute winter	BGR 05	9600	91.364	0.111	0.4	65.8904	0.0000	OK
960 minute winter	BGR 06	900	90.464	0.084	0.9	18.5120	0.0000	OK
10080 minute winter	BGR 07	9600	89.745	0.111	0.4	65.2566	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
180 minute winter	MH 21.0	16.001	MH 20.0	3.8	0.754	0.210	0.0152	
180 minute winter	MH 20.0	15.002	MH 01.1	3.9	0.635	0.097	0.1387	
15 minute winter	MH 01.1	11.010	MH 01.0	67.6	2.262	0.143	1.2599	
15 minute winter	MH 01.0	1.017	HEADWALL	42.0	4.078	0.019	0.1744	134.7
1440 minute winter	BGR 01	1.000	RFO 01	0.1	0.117	0.005	0.0087	
960 minute winter	BGR 02	3.000	RFO 02	0.1	0.122	0.004	0.0032	
960 minute winter	BR 03	4.000	RFO 03	0.1	0.109	0.005	0.0083	
1440 minute winter	BGR 04	7.000	RFO 04	0.1	0.115	0.005	0.0097	
10080 minute winter	BGR 05	14.000	RFO 05	0.1	0.127	0.005	0.0047	
960 minute winter	BGR 06	15.000	RFO 06	0.1	0.121	0.006	0.0089	
10080 minute winter	BGR 07	10.000	RFO 07	0.1	0.141	0.005	0.0023	

STONEY WOOD QUARTER, THE FAIRWAY, THE LONDON BOROUGH OF BARNET

TOWNSCAPE AND VISUAL IMPACT ASSESSMENT ADDENDUM – VIEWPOINT 7

JUNE 2026

INTRODUCTION

This addendum has been prepared to supplement the November 2025 Townscape and Visual Impact Assessment (TVIA) for Stoney Wood Quarter, in response to a request for an additional representative viewpoint. It should be read alongside the submitted TVIA.

The original TVIA considered the baseline condition of the Site, the character of the adjoining residential streets, the relationship with The Fairway, the woodland and golf course edge to the north and west, and the wider urban-edge setting formed by the M1, the railway corridor, Barnet Way and the surrounding suburban neighbourhood. It confirmed that the Site is not located within a conservation area, contains no designated heritage assets and does not form part of any protected or recognised strategic view.

The TVIA assessed the visual effects of the Proposed Development from a series of representative viewpoints, including views from the surrounding residential areas and recreational views associated with the Green Belt and Mill Hill Golf Club. It concluded that the principal visual changes would be localised, and that in most wider views the Proposed Development would be screened, filtered by vegetation or experienced as a limited background element.

The purpose of this addendum is to assess a further viewpoint, Viewpoint 7, from a close-range residential receptor position on The Fairway, near Fairway Court. It provides a supplemental assessment of the visual relationship between the Proposed Development and the established residential street scene at this part of The Fairway.

The addendum applies the same approach, terminology and judgement as the submitted TVIA. Viewpoint 7 has been assessed using the framework set out in Sections 7 and 8 of the submitted TVIA, considering receptor context and sensitivity, baseline conditions, proposed visibility, magnitude of change and residual visual effect, with reference to the Guidelines for Landscape and Visual Impact Assessment, Third Edition (GLVIA3), as listed at Appendix 1 of the submitted TVIA. The findings are summarised at Table 8B of this addendum, which follows the format of Table 8A (Summary of Operational Visual Effects) in the submitted assessment, and the visualisation has been prepared with reference to the methodology at Appendix 2. The addendum does not replace the submitted assessment or alter the baseline characterisation but provides a focused assessment of Viewpoint 7 on a consistent basis.

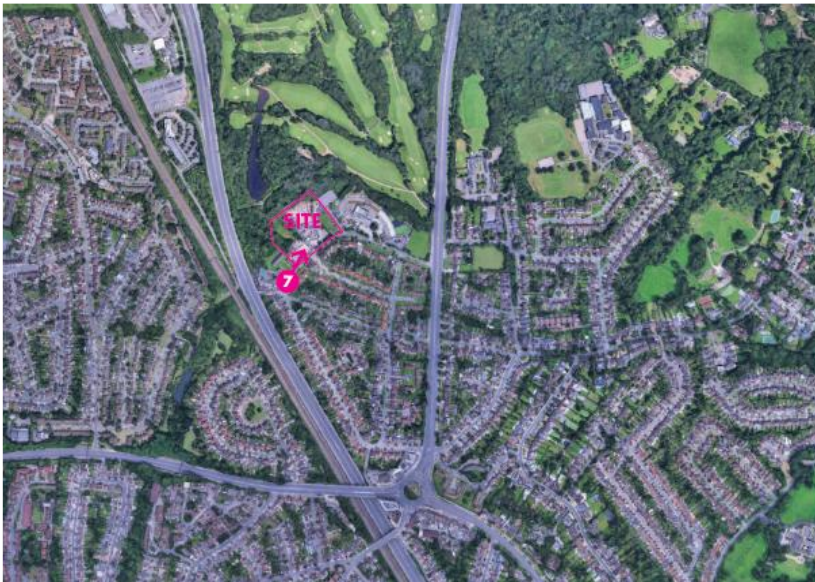
The additional viewpoint is relevant given the existing Site condition is not neutral in townscape terms. In views along this part of The Fairway, the Site is associated with a break in the residential frontage and a hoarded car-storage condition, rather than a positive or active street edge.

VIEWPOINT 7 SELECTION

Viewpoint 7 is located on the northern footway of The Fairway, close to Fairway Court, looking east / north-east along the residential street towards the Site. The viewpoint has been selected to assess the visual effect of the Proposed Development from a close-range local residential receptor, where the scheme would be experienced in the context of the existing suburban streetscape.

The view is characterised by two-storey residential properties, front gardens, boundary hedges, grass verges, street trees, overhead services and parked vehicles. In the existing condition, the Site is experienced as a break in the residential frontage and as a hoarded-off car storage area rather than as a positive townscape feature. The view is filtered by intervening housing, vegetation and the alignment of The Fairway.

The viewpoint is representative of views available to local residents, pedestrians and road users moving along this part of The Fairway.



Viewpoint 7 - Existing

ASSESSMENT OF VISUAL IMPACT

Receptor Context and Sensitivity:

This viewpoint reflects the experience of local residents, pedestrians and road users moving along The Fairway close to Fairway Court. The street has local residential value and is experienced repeatedly by nearby residents, but it is not a designated or protected view. Receptor sensitivity is Medium.

Baseline Conditions:

The baseline view is defined by two-storey suburban housing, grass verges, parked vehicles, boundary hedges, mature street trees and overhead services. The street has a familiar domestic character, but the Site itself forms a gap in the street frontage and is associated with a hoarded car storage use rather than a coherent residential edge.

Proposed Visibility:

The Proposed Development would be clearly perceptible within this view. At close range it would be read in the middle-ground of the street scene, introducing built form of greater scale than the immediate two-storey housing, together with a designed residential frontage, landscape structure and clearer townscape enclosure in place of the existing hoarded gap. In addition, glimpses of built form would be visible in the background above and behind Fairway Court, filtered by the mature tree canopy, denoting the presence of a residential neighbourhood extending to the north-east.

Magnitude of Change:

Medium. At close range, the Proposed Development would be a new and clearly perceptible element in the view, introducing a defined built frontage and landscape edge where the street currently reads as incomplete and hoarded. Glimpses of further built form in the background to Fairway Court would also be perceptible, indicating the wider extent of the residential neighbourhood to the north-east. The composition of the view would change materially, while remaining set within the established residential street.

Residual Effect:

Moderate Beneficial. The Proposed Development would introduce additional built form at close range but would also resolve the existing gap in the street frontage and replace the hoarded car-storage condition with a more ordered residential and landscape composition. The glimpses of built form in the background to Fairway Court would read as part of a coherent residential neighbourhood to the north-east rather than as an isolated element. The proposed landscape works would reinforce the green character of the street and improve the quality and coherence of the view.



Viewpoint 7 - Proposed

ASSESSMENT OF VISUAL IMPACT

SUMMARY TABLE

Table 8B Addendum Summary of Operational Visual Effects from Viewpoint 7

VP	Location / Receptor Context	Receptor Sensitivity	Magnitude of Change (Operational)	Residual Visual Effect (Operational)
7	The Fairway close to Fairway Court – residential street view experienced by local residents, pedestrians and road users moving along The Fairway.	Medium	Medium – clearly perceptible new built form experienced at close range in the residential street view, together with the replacement of a hoarded car-storage gap with a clearer built and landscaped frontage, and glimpses of built form in the background to Fairway Court denoting the residential neighbourhood to the north-east.	Moderate Beneficial – the development introduces a clearly perceptible new built frontage in place of the hoarded car-storage gap, improving the continuity of the street edge, with background glimpses to Fairway Court reading as part of a coherent residential neighbourhood, supported by new tree planting.

CONCLUSION

This addendum considers an additional viewpoint, Viewpoint 7, at close range from a position on The Fairway near Fairway Court, where the receptors are local residents, pedestrians and road users. The viewpoint is not designated or protected, but it is representative of an everyday residential view and provides a supplementary assessment of the Proposed Development from the local street environment to the south-west of the Site.

The assessment identifies a Medium receptor sensitivity. This reflects the local residential value of the view and the repeated experience of the street by nearby residents and pedestrians, while recognising that it is not a protected, designated or strategic view.

The Proposed Development would be clearly perceptible from this location. It would introduce built form of greater scale than the adjoining two-storey housing and would be read as a new element in the middle-ground of the view. Glimpses of built form would also be apparent in the background above Fairway Court, denoting the presence of the residential neighbourhood extending to the north-east. The change would therefore be materially apparent, and the magnitude of change is assessed as Medium. This judgement reflects both the visibility of the Proposed Development and the fact that the composition of the view would change from one in which the Site reads as an incomplete, hoarded edge to one in which there is a more defined residential frontage and landscape structure.

The nature of the change is assessed as beneficial. In the baseline view, the Site forms a break in the street frontage and is associated with a hoarded car-storage condition rather than a positive townscape feature. The Proposed Development would replace this condition with a designed residential frontage, clearer townscape enclosure and a defined landscape edge. While the scheme would introduce additional built form, it would also improve the continuity, legibility and quality of the street scene at this point on The Fairway.

The residual visual effect is therefore assessed as Moderate Beneficial. This reflects the balance between the development being visibly different from the existing condition, and taller than the immediate domestic foreground, and its replacement of a weak and inactive edge with a more coherent residential and landscape composition.

The viewpoint is presented in leaf-on conditions, reflecting the time of year the assessment was made. In leaf-off conditions a greater proportion of the Proposed Development would be visible through the canopy. This would increase the visibility of the new built form but would not change the overall judgement that the replacement of the existing hoarded car-storage condition with a designed residential frontage and landscape edge gives rise to a Moderate Beneficial residual effect.

Viewpoint 7 is consistent with the pattern of visual effects recorded in the submitted TVIA. It supports the finding that the clearest visual changes would occur locally on and around The Fairway, where the Proposed Development would replace the existing utilitarian site condition with a more coherent residential quarter. More distant views would remain largely screened, filtered or limited, as set out in the submitted assessment. The conclusions of the November 2025 TVIA therefore remain valid and are not altered by this addendum.