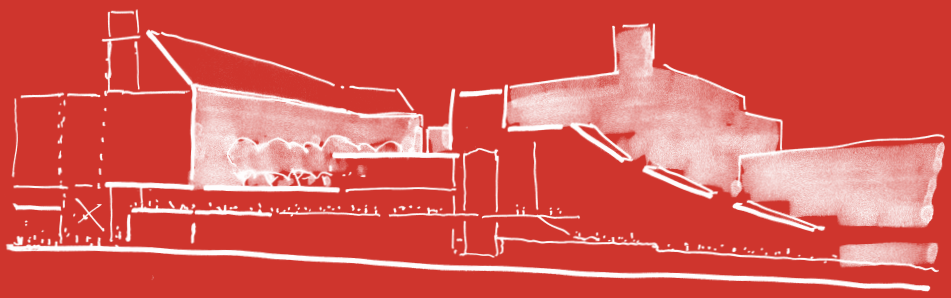
The British Library Extension
January 2022

Biodiversity Net Gain Assessment Report



British Library

Biodiversity Net Gain Assessment Report

Issue Rev 1

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Job number 249622-12

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ARUP

Contents

1 Summary

This report has been prepared by Ove Arup and Partners Ltd. ('Arup') on behalf of the applicants: The British Library and a joint venture between Stanhope PLC and Mitsui Fudosan known as 'SMBL Developments Ltd' (the Applicants) in support of their application for the redevelopment of the land to the north of the British Library for an extension to the existing British Library, commercial development and CR2 infrastructure works. As part of this process, a Biodiversity Net Gain (BNG) baseline assessment for the proposed British Library extension was undertaken and the results are presented in this report.

The BNG calculations were undertaken using the Natural England Biodiversity Metric 2.0 (BM2.0). The calculations were used to ascertain the approximate habitat areas required to mitigate and compensate for the loss of semi-natural habitats as a result of the development, and to inform habitat enhancements to target a net gain in biodiversity. BM2.0 provides developers, planners, land managers and others with a tool to help limit damage to nature in the first place and to help it thrive.

The pre-development biodiversity calculations for the proposed British Library extension were based on the results of an extended Phase 1 habitat survey conducted on the 25th August 2020 by Arup ecologists, which formed part of a Preliminary Ecological Assessment and Site Evaluation. This pre-construction information has been used to calculate the number of 'biodiversity units' generated by the habitats present within the existing development site. As a unit of measurement, biodiversity units are the product of the size, distinctiveness and condition of the proposed habitats.

BM2.0 was then used to assess the post-construction units to be gained from the proposed British Library extension. Based on the current designs and assumptions discussed, the change in ecological value (between pre- and post-construction) for the proposed British Library extension is 0.93 biodiversity units for area-based habitats. This result is based on the loss of all habitats within the site and the creation of new urban habitats including green roofs, sustainable drainage features, grassland, scrub and ornamental planting. This constitutes a 32.69% net gain in biodiversity as a result of the proposed British Library extension, against a target of 10% BNG, thereby complying with current planning policy and upcoming legislation.

The proposed design has been developed to mitigate impacts on the pre-development site biodiversity and to maximise the opportunities for biodiversity post-development. The designs have also focused on selecting plant species that are resilient to climate change to help ensure the longevity of the site's biodiversity value.

The biodiversity design process was challenging due to the inclusion of the temporary use 'Story Garden' urban allotment, which is an important part of the baseline, as it provides an important foraging resource for pollinating invertebrates in this area of central London. For this reason, the design team found it imperative to include this habitat, to inform appropriate mitigation and motivate the design team to maximise the available development area and improve the quality of

habitats, to deliver the maximum opportunities for biodiversity at both the ground and roof levels.

2 Introduction

This report has been prepared by Ove Arup and Partners Ltd. ('Arup') on behalf of the applicants: The British Library and a joint venture between Stanhope PLC and Mitsui Fudosan known as 'SMBL Developments Ltd' (the Applicants) in support of their application for the redevelopment of the land to the north of the British Library for an extension to the existing British Library, commercial development and CR2 infrastructure works. As part of this process, a Biodiversity Net Gain (BNG) baseline assessment for the proposed British Library extension was undertaken and the results are presented in this report.

2.1 Legislation and Policy

There are a number of local and national policy considerations and emerging legislation relating to BNG.

The National Planning Policy Framework (NPPF) states that planning decisions should minimise impacts on, and provide net gains for, biodiversity[1].

The Environment Bill 2019-2021, which is passing through the House of Commons at the time of writing this report, if given Royal Assent, will mandate BNG into legislation. There is, therefore, a requirement to consider and address BNG in order to pre-empt legislative requirements, and to comply with current policy, as a material consideration of any planning application. A 10% increase in biodiversity value is considered as the proposed threshold to achieve BNG[2].

The NPPF[1] is implemented at the local level in this instance by the Camden Local Plan[3]. Within this the Council states it will 'assess developments against their ability to realise benefits for biodiversity through the layout, design and materials used in the built structure and landscaping elements of a Proposed Development, proportionate to the scale of development proposed' and consider the '…safeguarding of habitats and species.'

Camden Planning Guidance[4] on biodiversity states the following as key points:

- A biologically diverse natural environment has an important role in economic prosperity, health and wellbeing of Camden residents, workers and visitors;
- Councils have a statutory duty to have regard to the purpose of conserving biodiversity, particularly where there are protected species and habitats;

[1] Ministry of Housing, Communities and Local Government, 2019. National Planning Policy Framework. February, 2019. Section 170. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/810197/NPPF_Feb_2019_revised.pdf
[2] Defra, 2019. Net Gain: Summary of responses and government response. July, 2019
[3] Camden Local Plan. Available at: https://www.camden.gov.uk/documents/20142/4820180/Local+Plan.pdf/ce6e992a-91f9-3a60-720c-70290fab78a6
[4] Camden Planning Guidance – Biodiversity. Available at: https://www.camden.gov.uk/documents/20142/4823269/Biodiversity+CPG+March+2018.pdf/daf83dad-d68d-6964-99b4-aef65d639304

- Biodiversity may be a material consideration whether or not the site or any features (e.g. habitats, species) benefit from any statutory protection; and
- Proposals must demonstrate how biodiversity considerations have been incorporated into the development; how the five-point Mitigation Hierarchy has been addressed; and what positive measures for enhancing biodiversity are planned.

2.2 Principles of the Biodiversity Metric

The BNG calculations were undertaken using the Natural England Biodiversity Metric 2.0[5] (BM2.0). The calculations for the British Library extension were used to ascertain the approximate habitat areas required to mitigate and compensate for the loss of semi-natural habitats as a result of the development, and to inform habitat enhancements to target a net gain in biodiversity. BM2.0 provides developers, planners, land managers and others with a tool to help limit damage to nature in the first place and to help it thrive.

BM2.0 uses habitat features as a proxy measure for capturing the value and importance of nature. It uses a simple calculation that takes into account the importance of these features for nature by assessing: their size, ecological condition, location and proximity to nearby 'connecting' features. BM2.0 enables assessments to be made of the present ecological baseline and to forecast the future biodiversity value of a site.

The metric accounts for some of the risks associated with the creation of a new habitat or an enhancement of existing habitat, including the level of difficulty in creating or restoring that habitat, and the temporal risk (i.e. the time a new habitat takes to establish) involved.

In calculation terms, the change in biodiversity units is determined by subtracting the number of pre-intervention biodiversity units (i.e. those originally existing on-site) from the number of post-intervention units (i.e. those projected to be provided).

BM2.0 includes additional supplementary modules for habitats that are not well described by their area. These are linear habitats, for which habitat length is often a more meaningful measure of their extent than area, broadly applying to hedgerows and lines of trees, rivers and streams. These linear features of the metric are calculated differently and have their own discrete biodiversity unit types. It is an important rule of the metric that the biodiversity units calculated through the core habitat area-based metric and each of the linear units are unique and cannot be summed or converted.

It is worth noting that BM2.0 does not explicitly take species into account . Instead, BM2.0 uses broad habitat categories as a proxy for the biodiversity 'value' of the species communities that make up different habitats. The metric does not change existing levels of species protection and the processes linked to protection regimes are outside the scope of the metric.

[5] Natural England (2019) The Biodiversity Metric 2.0. Available at: http://publications.naturalengland.org.uk/publication/5850908674228224

3 Methodology

3.1 Pre-Development

The pre-development biodiversity calculations for the proposed British Library extension were based on the results of an extended Phase 1 habitat survey conducted on the 25th August 2020 by Arup ecologists, which formed part of a Preliminary Ecological Assessment and Site Evaluation[6]. These have since been transformed into BNG habitat categories, which can be found in Appendix A.

The scattered trees within the site do not sit within a primary BNG habitat category. Therefore, the JNCC phase 1 habitat code[7] has been used (A3.1), accompanied by the UKHab secondary habitat code (11), which relates to scattered trees but is not available within the BNG categories.

This pre-construction information has been used to calculate the number of 'biodiversity units' generated by the habitats present within the existing development site.

3.2 Post-Development

The post-development calculations are based on the area allocations shown in Appendix B and Appendix C. This divides habitat creation planned as part of the British Library extension into the following BNG habitat categories:

- Urban – Woodland;
- Grassland – Modified grassland;
- Urban – Rain garden;
- Urban – Introduced shrub;
- Urban – Vegetated garden;
- Heathland and shrub – Mixed scrub;
- Urban – Developed land; sealed surface;
- Urban – Extensive green roof;
- Grassland – Other neutral grassland; and
- Lakes – Temporary lakes, ponds and pools.

Some areas of landscaping adjacent to Ossulston Street are being designed by the local community and the post-construction design for this has not yet been finalised. Therefore, this has not been included within the proposed British Library extension.

[6] Ove Arup and Partners (2020). British Library Extension, Preliminary Ecological Assessment and Site Evaluation.
[7] Joint Nature Conservation Committee (2010). Handbook for Phase 1 habitat survey. Available at: https://data.jncc.gov.uk/data/9578d07b-e018-4c66-9c1b-47110f14df2a/Handbook-Phase1-HabitatSurvey-Revised-2016.pdf

It has been assumed that all habitats on site will be lost, to facilitate the development.

This post-construction information has been used to calculate the number of 'biodiversity units' generated by the habitats present within the proposed British Library extension.

3.3 Habitat Calculations

Natural England's BM2.0 was used to assess the biodiversity units lost and gained from the proposed British Library extension. As a unit of measurement, biodiversity units are the product of the size, distinctiveness and condition of a habitat as described below.

3.3.1 Distinctiveness Scoring

In BM2.0, habitats are automatically assigned distinctiveness bands based on the following criteria of distinguishing features:

- Total amount of remaining habitat in England (its rarity);
- % of habitat protected in Sites of Special Scientific Interest: where less is protected in these sites, it is scored as having higher distinctiveness;
- UK Priority Habitat Status[12]: Priority Habitats area classed as High or Very High; and
- European Red List Categories for the habitat.

Following BM2.0, each habitat is scored for distinctiveness as Very High (8), High (6), Medium (4), Low (2) or Very Low (0). The scores automatically applied to each habitat type are set out in Table 1 below.

Table 1 Habitat distinctiveness bands and criterion thresholds

Distinctiveness Band	Criterion Threshold
Very high distinctiveness	Small amount of remaining habitat with a high proportion unprotected by designation. Endangered or Critical European Red List habitats. Certain Priority Habitats
High distinctiveness	Remaining Priority Habitats not in very high distinctiveness band & other Red List of habitats.
Medium distinctiveness	Non-Priority Habitats with significant wildlife benefit and one replaceable Priority Habitat (Arable field margins).
Low distinctiveness	Agricultural and Urban land use of lower biodiversity value.
Very low distinctiveness	Urban – with artificial structure which are un-vegetated, unsealed surface or built linear features of very low biodiversity value.

3.3.2 Condition Scoring

Condition is defined as the quality of a particular habitat. For example, a habitat is in poor condition if it fails to support the rare or notable species for which it is

valued, or if it is degraded as a result of pollution, erosion, invasive species or other factors. The approach used is analogous to that used for Common Standards Monitoring[8] of protected sites in the UK where key attributes and positive and negative indicators are used. Assessment criteria used to determine condition each habitat is set out in Defra's guidance[9].

3.3.3 Connectivity Scoring

As detailed in the BM2.0 connectivity tool guidance, the connectivity tool should be used only to calculate ecological connectivity for habitats with a 'high' or 'very high' distinctiveness value.

For all habitats scoring 'medium' or lower, the interim guidance as described in the BM2.0 user guide should be implemented. In the user guide, it states that any habitats with a distinctiveness value of medium or lower should be afforded a connectivity score of 'low'.

In the case of the proposed British Library extension, proposed wetland habitat at the roof level was identified as having high distinctiveness value and the connectivity tool was therefore used to afford a connectivity score. The tool afforded this habitat a 'low' connectivity score.

The remaining habitats had a distinctiveness value of poor, fairly poor or moderate and the connectivity tool was not used for these habitats and a default connectivity score of 'low' was assigned.

3.3.4 Scoring Assumptions

The calculations have assumed that the habitats created as a result of the proposed British Library extension will largely comprise species of known benefit to biodiversity, except where their design intent is clearly not to function as a resource for biodiversity (e.g. introduced shrub and raised planters at the ground level). Should the future design decisions select species of no known benefit to biodiversity or improve the design for biodiversity within the Level 2 roof and at ground level, then the scores may need to be adjusted accordingly.

The scoring has taken into account the presence of an artificial lighting scheme (as shown in Appendix E), which is known to negatively impact nesting birds, invertebrates and photophobic species such as bats. Industry guidance[10] will be followed to reduce impacts on wildlife; however, permanent lighting will remain a feature of the proposed British Library extension and will be concentrated at Dangor Walk. Should lighting be increased or significantly decreased (either permanently, or through timing to reduce persistence of lighting during critical periods of bat activity), then the scores may need to be adjusted accordingly. However, the existing site is not intrinsically dark, and as such, light levels will not

[8] JNCC (2017) Common Standards Monitoring. Available at: http://jncc.defra.gov.uk/page-2273
[9] DEFRA (2019) The Biodiversity Metric 2.0, auditing and accounting for biodiversity, Technical Supplement. Available at: http://publications.naturalengland.org.uk/publication/5850908674228224
[10] Institute of Lighting Professionals (2018) Guidance Note 8 Bats and Artificial Lighting. Available at: https://www.theilp.org.uk/documents/guidance-note-8-bats-and-artificial-lighting/

be increased. In addition, artificial lighting will be heavily reduced and mitigated within the community garden area and cells of planting adjacent to Ossulston Street, also known as the 'residential zone' (see the residential zone within Appendix E). In this area, lighting will be focused on activity areas and circulation routes, and areas of planting will not to be illuminated.

The urban allotment site, more commonly known currently as the 'Story Garden', comprises largely bare ground, small storage buildings and limited allotment planting, arranged in raised planters and recycled skips. Therefore, the actual urban allotment has been assumed to occupy 75% of the Story Garden, which is a generous figure in practice. However, this motivates the design aims to be ambitious, to ensure the provision of greater, improved connections and higher quality habitats, resulting in the maximum opportunities for biodiversity at both the ground and roof levels.

A list of post-construction scores for all habitats are detailed in Appendix D.

3.3.5 Habitat Creation and Restoration Risk

The risks associated with habitat creation and restoration are acknowledged in the BM2.0 calculation. In the metric, there are three possible categories for the difficulty of habitat creation and restoration (Low, Medium and High). The factors that are considered to potentially influence these categories are:

- Hydrological requirements;
- Seed source or biological material requirements;
- Future constraints;
- Low soil nutrient status;
- Trophic status conditions; and
- Ongoing management requirements.

These factors are described in greater detail in the BM2.0 guidance[5].

Each created and enhanced habitat has been scored using the factors listed above. The categorical values for difficulty of creation and restoration, the target condition and the time to target condition for each of these habitats are provided in Table 2 below.

Table 2 Area habitat categorical values for difficulty of creation, target condition and time to target condition.

Habitat Type	Distinctiveness	Difficulty of Creation	Target Condition	Time to target condition (years)
Urban - Woodland	Medium	Low	Moderate	27
Grassland – Other neutral grassland	Low	Low	Fairly poor	5
Urban – Rain garden	Low	Low	Moderate	1
Urban – Ground level planters	Low	Low	Moderate	1
Urban – Ground level planters	Low	Low	Moderate	1
Heathland and shrub – Mixed scrub	Medium	Low	Fairly Poor	2
Urban – Developed land; sealed surface	Very low	Low	N/A – Other	0
Urban – Extensive green roof	Medium	Medium	Moderate	3
Urban – Extensive green roof	Medium	Medium	Moderate	3
Grassland – Other neutral grassland	Medium	Low	Good	15
Lakes – Temporary lakes, ponds and pools	High	Medium	Good	10
Grassland – Other neutral grassland	Medium	Low	Good	15
Heathland and shrub – Mixed scrub	Medium	Low	Good	7
Grassland – Other neutral grassland	Medium	Low	Fairly Poor	5
Grassland – Other neutral grassland	Medium	Low	Fairly Poor	5

3.4 Limitations

These net-gain calculations do not take account of the habitat requirements of the individual and protected species which may be affected by the proposed British Library extension. The habitat requirements of individual species/species groups are considered in the assessment reported in the 2020 Preliminary Ecological Assessment and Site Evaluation[6].

4 Results

4.1 Current Design

Appendix B and Appendix C show the proposed ground level and green roof landscape design for the British Library extension.

As shown in **Table 3** below, based on the current designs and assumptions discussed, the change in ecological value for the proposed British Library extension is **0.93 biodiversity units** for area based habitats.

This result is based on the loss of all habitats within the site and the creation of urban habitats including green roofs, sustainable drainage features, grassland, scrub and ornamental planting. This constitutes a **32.69 net gain in biodiversity** as a result of the proposed British Library extension, against a target of 10% BNG.

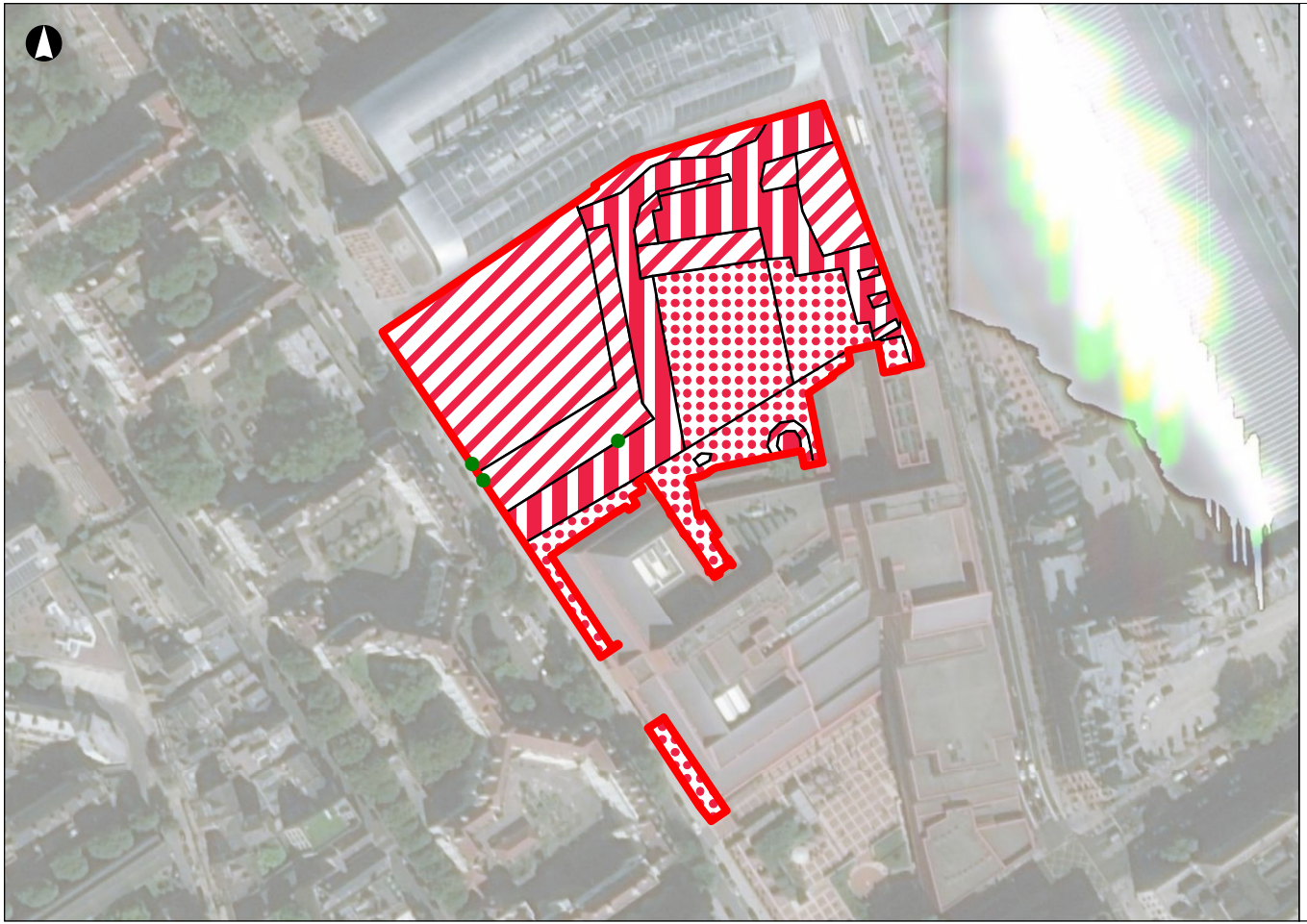
Table 3 Summary table of the calculation that achieves 32.69% biodiversity net gain.

Net biodiversity units	0.93
Total biodiversity % change	32.69

Appendix A

Pre-Development BNG Habitat Classifications

A1



British Library pre development BNG habitat classifications

Legend

Redline boundary

A3.1 - Broadleaved parkland/scattered trees (11)

UK Hab Classification

u1 - built-up areas and gardens

u1b - developed land, sealed surface

u1b5 - buildings

Revision	Date	By	Chkd	Appd
P1	10-08-21	FJ	TM	NH

Metres

0 25 50 100

Not to scale

1:2,500

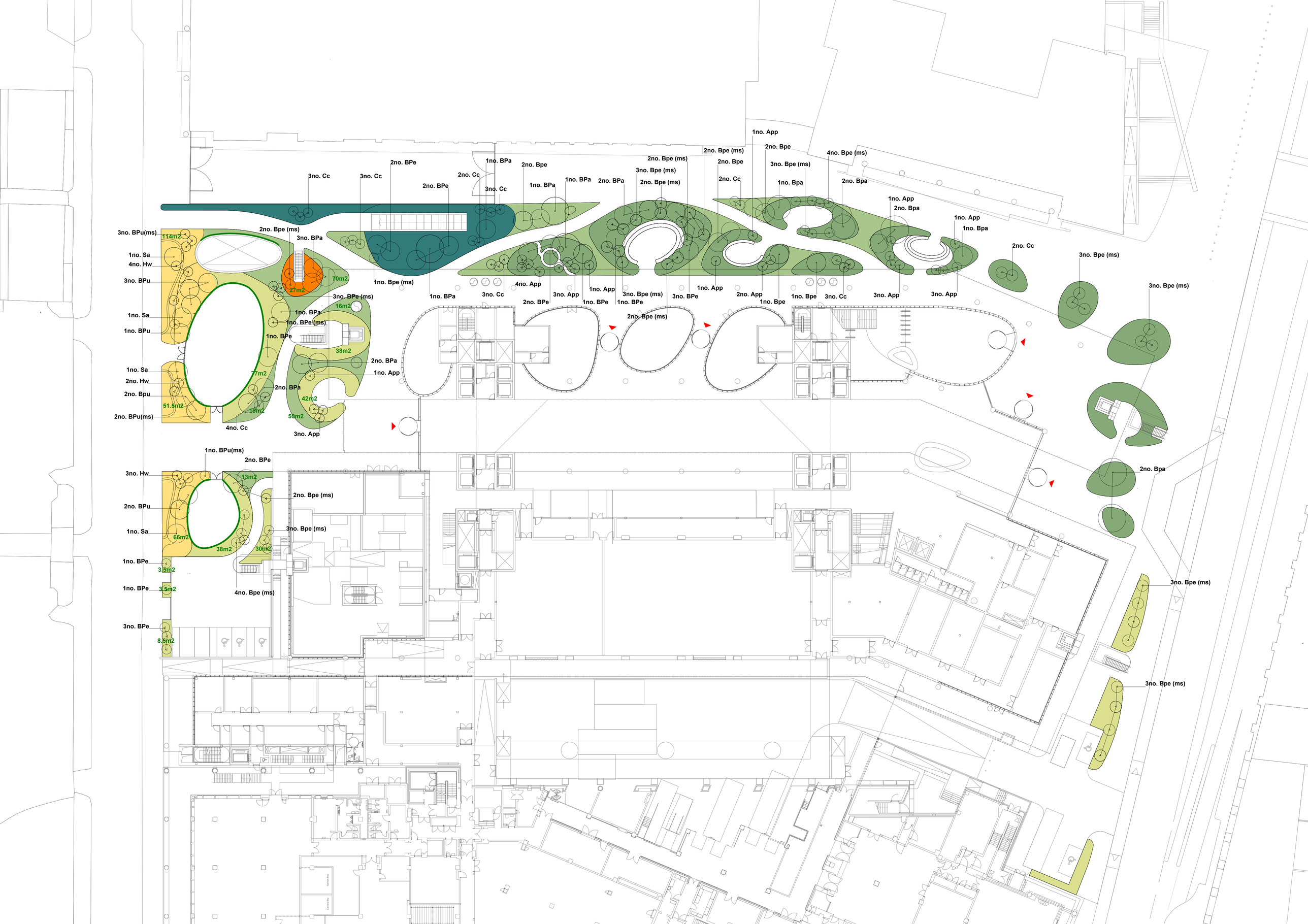
Job No	Drawing Status
249622	**Issue**

Drawing No	Revision
001	**P1**

Appendix B

Ground Level Landscape Design

B1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3no. BPu(ms)
114m2
2no. Bpe (ms)
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70m2
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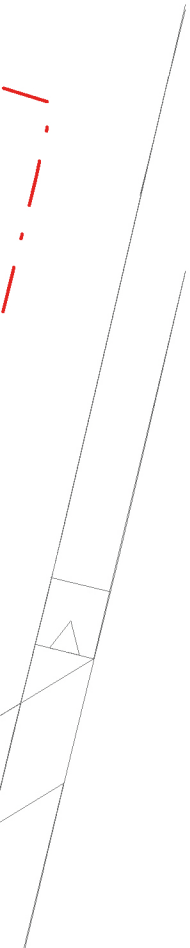


Soft Landscape

Proposed Planting Mix 1: Shade/Partial

Proposed Planting Mix 2: Sun

Proposed Planting Mix 3: SUDs planting

Proposed Planting Mix 4: Climbers

Proposed Planting Mix 5: Ground cover

Proposed Planting Mix 6: Ground cover

Proposed Planting Mix 7: Species Rich Grassland

Single Stem Tree

Multi Stem Tree

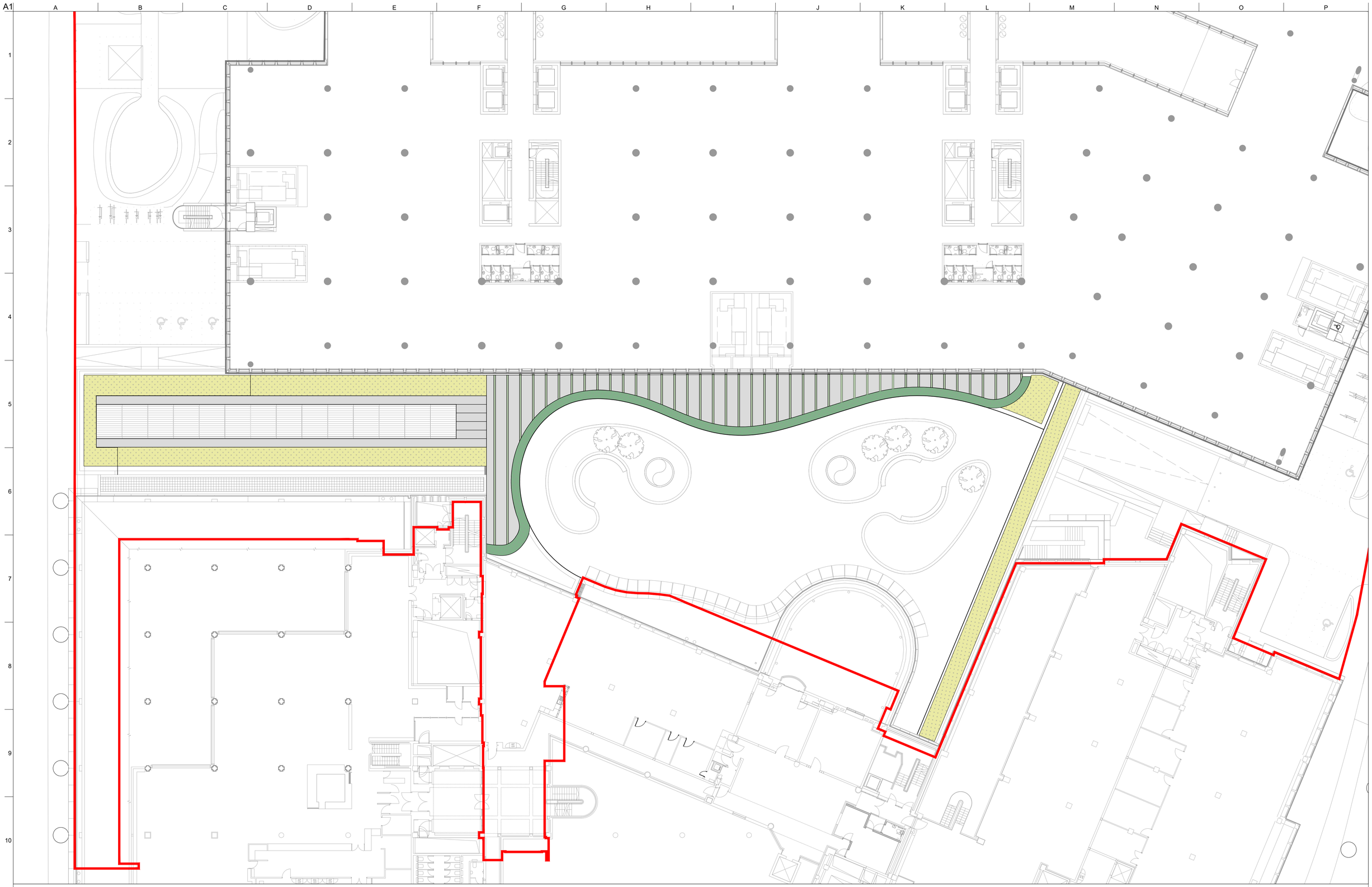
Refer to Landscape Schedule 60.001 for details of planting mix and trees

Appendix C

Roof Level Landscape Design

C1

A1



LEGEND

- Structural edge planting
- Species-rich grassland planting
- High-quality paving with banding
- Site-won pavers
- Raised planter
- Site Boundary

0 2.5 5 10 15 20m

Issue	Date	By	Chkd	Appd
04	23/09/21	SPE	SG	SG
03	26/08/21	SPE	RC	RC
02	19/08/21	SPE	RC	RC
01	06/08/21	SPE	RC	RC

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Drawing Title
General Arrangement
Level 2

Scale at A1 1:200

Discipline Landscape Architecture

Job No 249622

Drawing Status For Planning

Drawing No BL-ARUP-ZZ-02-DR-L-000101

Issue 04

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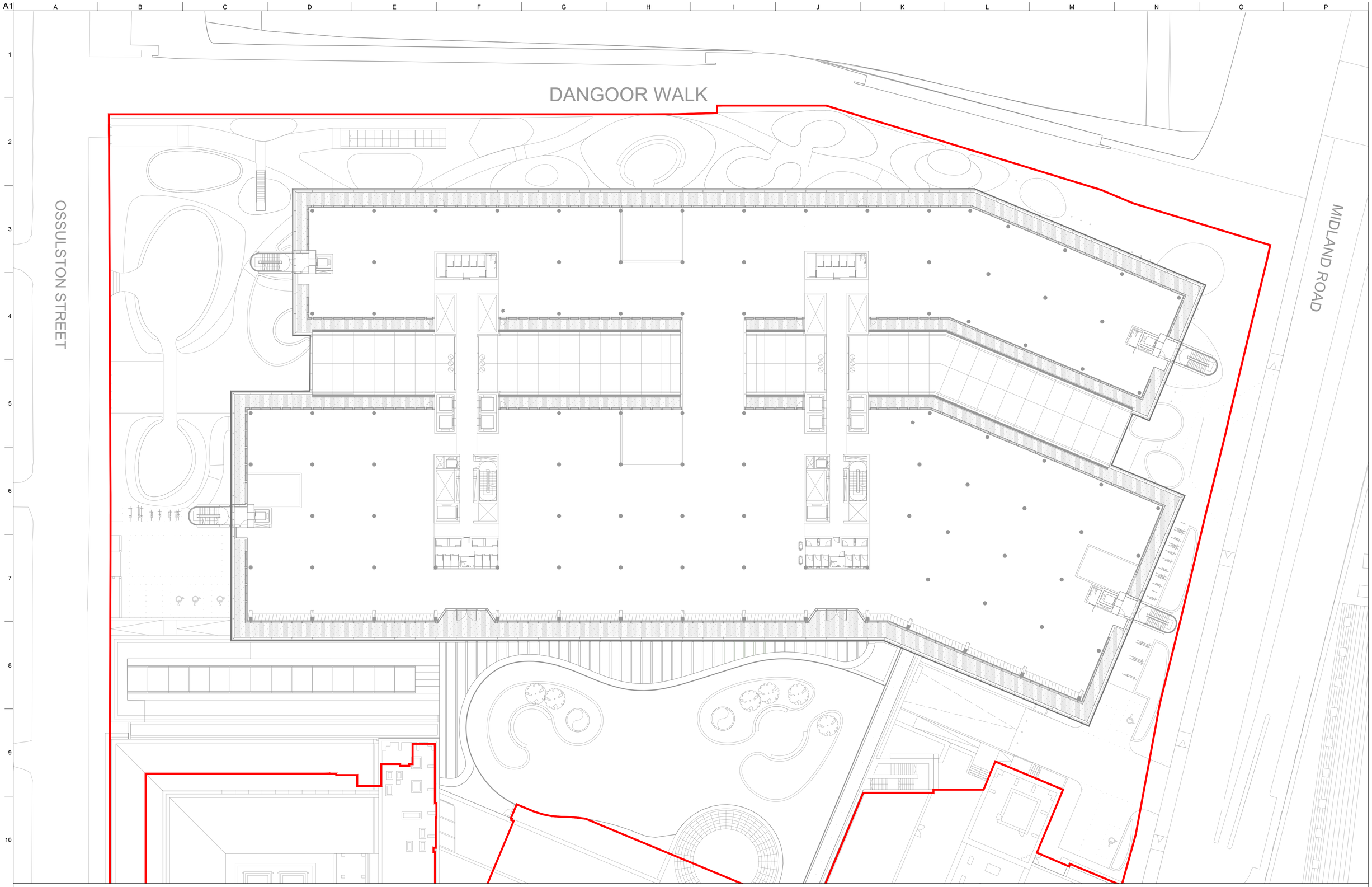

LEGEND

High-quality paving

Site Boundary

0 2.5 5 10 15 20 25m

Issue	Date	By	Chkd	Appd
04	23/09/21	SPE	SG	SG
03	26/08/21	SPE	RC	RC
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01	06/08/21	SPE	RC	RC

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Level 8

Scale at A1 1:250

Discipline Landscape Architecture

Job No 249622

Drawing Status For Planning

Drawing No BL-ARUP-ZZ-08-DR-L-000102

Issue 04

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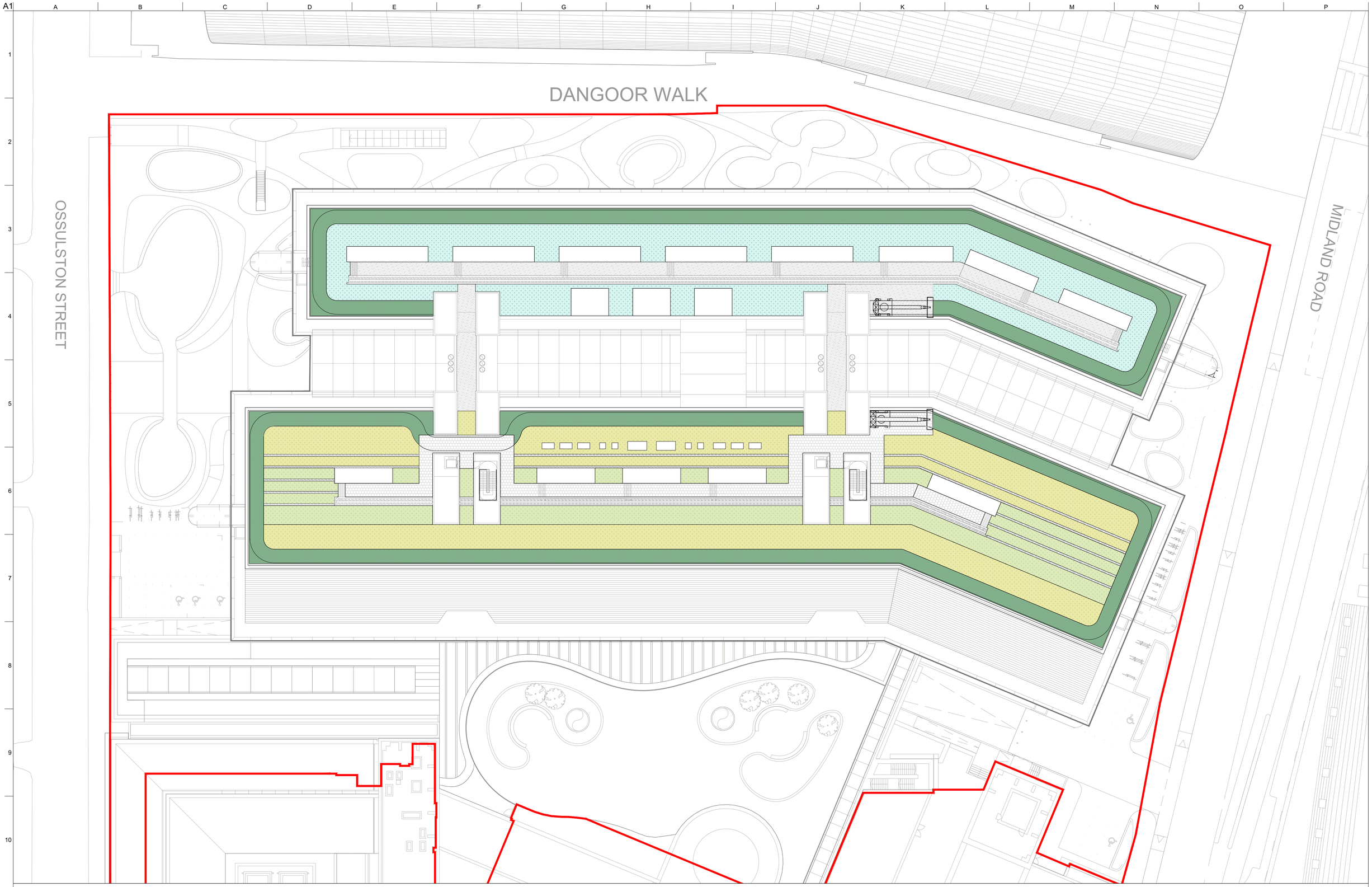

LEGEND

- Wetland planting
- Species-rich grassland planting
- Woodland edge planting
- BMU planting
- Decking (Plant/BMU access)
- Site-won pavers (Plant/BMU access)
- Gravel
- Site Boundary

0 2.5 5 10 15 20 25m

Issue	Date	By	Chkd	Appd
04	23/09/21	SPE	SG	SG
03	26/08/21	SPE	RC	RC
02	19/08/21	SPE	RC	RC
01	06/08/21	SPE	RC	RC

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Job Title
British Library Extension (BLE)

Drawing Title
General Arrangement
Roof Level

Scale at A1: 1:250

Discipline: Landscape Architecture

Job No: 249622

Drawing Status: For Planning

Drawing No: BL-ARUP-ZZ-RF-DR-L-000103

Issue: 04

Do not scale

Appendix D

Biodiversity Net Gain Assessment Results

D1

Table 4 Pre-development baseline habitat scores and units lost*.

Habitat type	Area (hectares)	Distinctiveness	Condition	Connectivity	Total habitat units	Area lost	Units lost
Urban - Street Tree	0.0122	Low	Moderate	Unconnected habitat	0.05	0.01	0.05
Urban - Amenity grassland	0.1234	Low	Poor	Unconnected habitat	0.27	0.12	0.27
Urban - Introduced shrub	0.2285	Low	Poor	Unconnected habitat	0.50	0.23	0.50
Urban - Developed land; sealed surface	0.555913	V. Low	N/A - Other	Unconnected habitat	0.00	0.56	0.00
Urban - Developed land; sealed surface	0.484913	V. Low	N/A - Other	Unconnected habitat	0.00	0.48	0.00
Urban - Allotments	0.306075	Medium	Fairly Poor	Unconnected habitat	2.02	0.31	2.02

Table 5 Post-development habitat creation scores and units delivered*.

Proposed habitat	Area (hectares)	Distinctiveness	Condition	Connectivity	Units delivered
Urban - Woodland	0.062	Medium	Moderate	Unconnected habitat	0.21
Grassland - Other neutral grassland	0.0329	Medium	Fairly Poor	Unconnected habitat	0.18
Urban - Rain garden	0.0231	Low	Moderate	Unconnected habitat	0.10
Urban - Ground level planters	0.0353	Low	Moderate	Unconnected habitat	0.15
Urban - Ground level planters	0.0218	Low	Moderate	Unconnected habitat	0.09
Heathland and shrub - Mixed scrub	0.0088	Medium	Fairly Poor	Unconnected habitat	0.05
Urban - Developed land; sealed surface	1.1227	V.Low	N/A - Other	Unconnected habitat	0.00
Urban - Extensive green roof	0.1041	Medium	Moderate	Unconnected habitat	0.55
Urban - Extensive green roof	0.008	Medium	Moderate	Unconnected habitat	0.04
Grassland - Other neutral grassland	0.0328	Medium	Good	Unconnected habitat	0.25
Lakes - Temporary lakes, ponds and pools	0.0757	High	Good	Unconnected habitat	0.70
Grassland - Other neutral grassland	0.0996	Medium	Good	Unconnected habitat	0.77
Heathland and shrub - Mixed scrub	0.0508	Medium	Good	Unconnected habitat	0.52
Grassland - Other neutral grassland	0.0027	Medium	Fairly Poor	Unconnected habitat	0.01
Grassland - Other neutral grassland	0.0245	Medium	Fairly Poor	Unconnected habitat	0.14

* biodiversity units are rounded to 2 decimal places.

Appendix E

Lighting Strategy

E1

Draft issue for comment
29.07.21

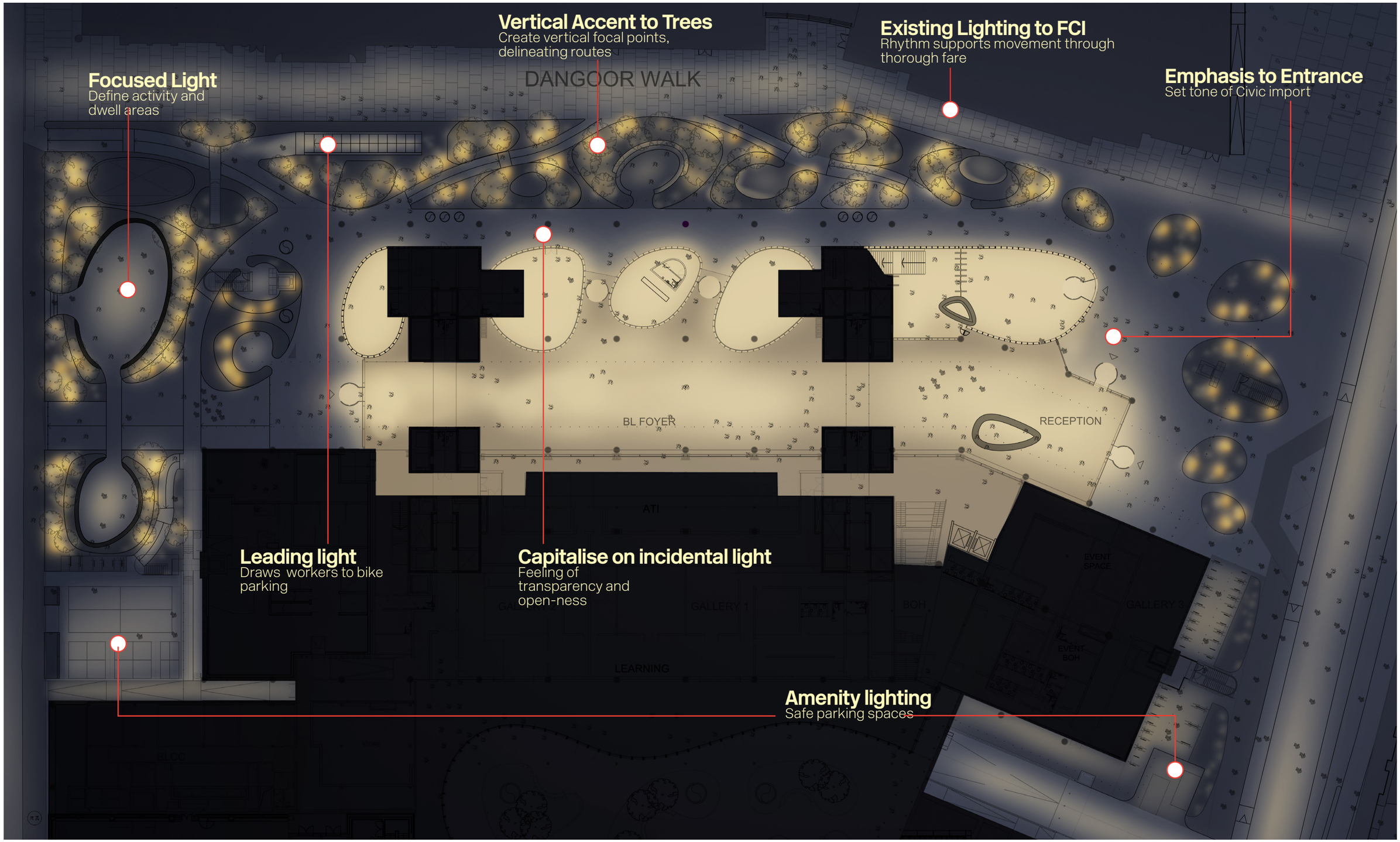
British Library Extension

Exterior Lighting Masterplan

ARUP

Lighting Map

Public Realm



Lighting Map

Courtyard

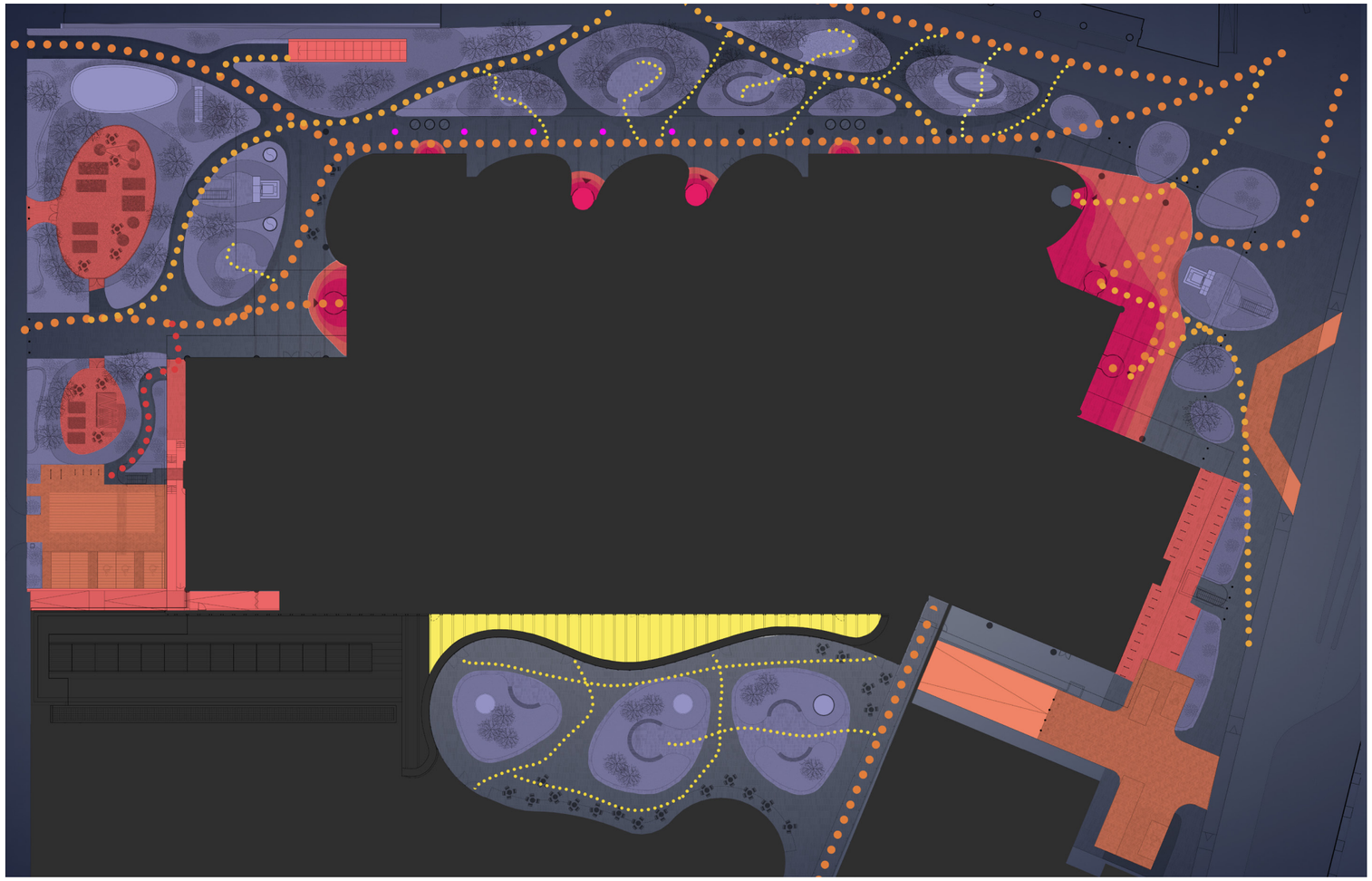
Design Strategy

Illuminance Levels

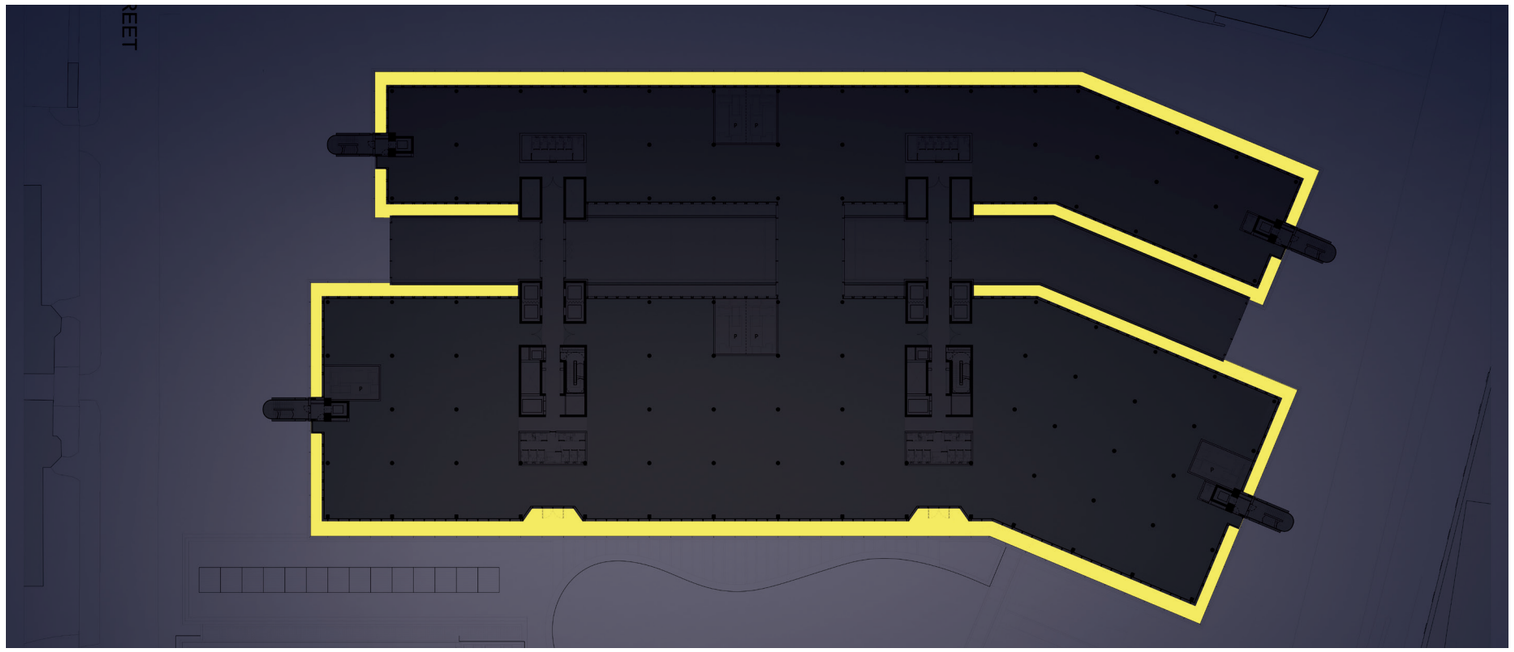
The following table has been informed by the below guidance documents. The illuminance map opposite presents the minimum maintained recommended general lighting requirements for the exterior lighting routes.

- Institute of Lighting Professionals (ILP) Guidance Note GN01 (2020): Guidance Notes for the Reduction of Obtrusive Light.
- BS EN 12464 Part 2: Outdoor Lighting.
- BS 5489 Part 1: Code of Practice for the design of road lighting.
- CIBSE SLL LG6 The Exterior Environment (2016)

Lighting Criteria		
Locations	**Average maintained horizontal illuminance**	**Average maintained vertical illuminance** (for facial recognition)
Entrances	50 lx	N/A
Entrance transition zones	30 lx	N/A
Activity areas	20 lx	N/A
Car park, activity areas	10 lx	N/A
Primary routes	5 lx	1.5 lx
Secondary routes	3 lx	1.0 lx
Tertiary routes	2 lx	0.6 lx
Accent lighting	Variable	N/A



Light map • Illuminance Levels, Lower Ground, First and Second floor



Light map • Illuminance Levels, Eighth Floor

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