

CATALYST BICESTER, WENDLEBURY ROAD, BICESTER

SUSTAINABLE URBAN DRAINAGE (SuDS) MAINTENANCE & MANAGEMENT PLAN

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CATALYST BICESTER SUSTAINABLE URBAN DRAINAGE (SuDS) MAINTENANCE & MANAGEMENT PLAN

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APPENDICES

- A As Built Drainage Layouts and Maintenance Access Details
- B Landscaping Management & Maintenance Plan
- C Drainage Material Specification and Checklist Log (To be Completed at Handover)
- D Photographic Record File (Management use only)
- E CCTV & Drainage Survey Reports (Management use only)

1 Introduction

- 1.1 This document sets out the principles for the long-term management and maintenance of the Sustainable Drainage Systems (SuDS) at Catalyst Bicester. This is a “Live Document” which has been revised to now include all phases of work including;
- Phase 1 of Units 1-4 and the David Lloyd development (Completed 2021),
 - Phase 2 of Units 5-8 and the Parklands (Completion 2024),
 - Phase 3 of Units 9-12 and the Wetlands (Completion 2025),
 - Phase 4 of Units 13-15 (Completion 2026),
- 1.2 SuDS are a new environmentally friendly approach to managing rainfall that uses landscape features to deal with surface water. SuDS aim to:
- Control the flow, volume and frequency of water leaving a development area,
 - Prevent pollution by intercepting silt and cleaning runoff from hard surfaces,
 - Provide attractive surroundings for the community,
 - Create opportunities for wildlife
- 1.3 The purpose of this document is to set out the basis of the development SuDS Maintenance Plan and to ensure that the management company is entrusted with a robust inspection and maintenance programme, ensuring the optimum operation of the surface water drainage network is continually maintained for the lifetime of the development and to prevent the increased risk of flooding both on and offsite in accordance with the National Planning Policy Framework (NPPF).
- 1.4 This Maintenance Plan is to be read in accordance with the FRA & Drainage Strategy Issue 3 (Phases 1-3) undertaken in February 2020 and the FRA & Drainage Strategy Issue 2 (Phase 4) undertaken in May 2024 by Bailey Johnson Hayes.
- 1.5 The activities listed in this document are generic to the relative SuDS types and represent the minimum maintenance and inspection requirements, however additional tasks or varied maintenance frequency may be instructed by the managing agent as required. Specific maintenance needs of the SuDS elements should be monitored, and maintenance schedules adjusted to suit requirements.
- 1.6 All those responsible for maintenance should follow relevant Health and Safety legislation (Health and Safety at Work Regulations, 1999) for all activities listed within this report including lone working, if relevant, and risk assessments should always be undertaken.
- 1.7 Any contractor employed by the Management Company shall carry out periodic maintenance of all such SuDS in accordance with the schedules listed in this report. Inspection checks shall be carried out by a qualified and competent person, at the minimum intervals listed within the schedules and the appropriate work carried out.

2 Managing the SuDS Features

2.1 The surface water drainage strategy for the proposed development utilises SuDS features to intercept and convey all surface water runoff. The design of the system aims to attenuate, treat, and reduce the velocity of runoff. Unfortunately, this site is not considered suitable for infiltration. There are additional flood compensation features which are designed to store river flooding water in extreme river flooding events. These should be treated similar to SuDS features for maintenance and management purposes.

2.2 The proposed surface water system(s) consists of the following SuDS components:

- Attenuation Basins,
- Permeable Paving,
- Geocellular Tanks,
- Petrol Interceptors,
- Hydrobrakes,
- Overflow Weir Manholes,
- Catchpits, Gullies and Line Drains,
- Non-Return Valves,
- Tree Pits,

2.3 In addition to the storm water SuDS systems, the proposed flood compensation system consists of the following components:

- Flood Compensation Basins;
- Existing Ditches/Watercourses;
- Overflow Weirs;
- Culverts

2.4 There are three categories of maintenance activities referred to in this report:

- **Regular maintenance** (including inspections and monitoring).
Consists of basic tasks done on a frequent and predictable schedule, including vegetation management, litter and debris removal, and inspections.
- **Occasional maintenance**
Comprises tasks that are likely to be required periodically, but on a much less frequent and predictable basis than the routine tasks (sediment removal is an example).
- **Remedial actions**
Comprises intermittent tasks that may be required to rectify faults associated with the system, although the likelihood of faults can be minimised by good design. Where remedial work is found to be necessary, it is likely to be due to site-specific characteristics or unforeseen events, and as such timings are difficult to predict.

2.5 The following section will specifically address SuDS Management and Maintenance items for the whole Catalyst Bicester site.

3 Site Specific Drainage Summary

3.1 Masterplan surface water drainage layouts are provided in **Appendix A**. In accordance with the approved FRA & Drainage Strategy, the SuDS at Catalyst Bicester have been designed for easy maintenance to comprise of the following components below.

3.2 Attenuation Basin / Swale 2 is in the center of the site and considered the main SuDS storage feature. This landscaped dry basin is approx. 200m long, 35m wide and 1.4m deep. It is designed with maximum 1:3 banks to encourage plants and wildlife to live and grow near water features. This basin services the run-off generated by Units 1-8 roofs, car parks, yards, estate roads and landscaping. Additionally, it is designed to take a maximum restricted outflow from the David Lloyd site of 60 litres / second. Note David Lloyd site drainage is outside the scope of this plan.

Flow routes from the car parks are via underdrain collection pipes which collect runoff from the permeable paving system before underground piped conveyance, eventually outletting into Swale 2 via headwalls. Roof water flows in traditional sealed pipes close to buildings, with unrestricted flows into Swale 2 via headwalls. Surface water collected in the yards is collected by heavy duty line drains, kerb drains or gullies which is then pre-treated in by-pass petrol interceptors, before discharging into Swale 2 via headwalls. The estate road uses gullies and kerb drains to collect water which are then conveyed by large common drains untreated into Swale 2.

Surface water collected in Swale 2 then flows into a single, flow-control manhole, before outletting into a re-newed ditch to the east of the site. An overflow weir facility is provided in failure conditions of the SuDS feature. Discharge limited to greenfield rate of 20 litres / second flows into the tributary ditch which conveyances the water into the larger Langford Brook river. Non-return valve prevents flow of flood water into the Basin.

3.2 Attenuation Basin / Swale 1 is located to the western corner of the site. This landscaped dry attenuation basin is approx. 100m long, 20m wide and 2.0m deep. It is designed with maximum 1:3 banks to encourage plants and wildlife to live and grow near water features. This basin services the run-off generated by Units 9-12 and associated car parks, yards, and footpaths.

Runoff from the car parks is conveyed via underdrain collection pipes to the permeable paving system which direct runoff run within towards main underground pipe runs before being discharged via headwalls into Swale 1. Roof water flows in traditional sealed pipes close to buildings, are transmitted unrestricted into Swale 1 via headwalls. Surface water in delivery yards and access roads is collected by heavy duty line drains or kerb drains which is then pre-treated in by-pass petrol interceptors before discharge into Swale 1 via headwalls.

Surface water collected in Swale 1 then flows through a single, flow-control hydro brake manhole, before outletting into an existing watercourse. An overflow weir facility in the manhole is provided so that runoff can discharge safely into the watercourse in failure conditions of the SuDS feature. Discharge is limited to greenfield runoff rate of 8 litres / second into the tributary watercourse of the larger Langford Brook river.

- 3.4 The delivery yards to Unit 13-15 is to be drained via a heavy duty line drain. Discharge from the yard is directed through a by-pass petrol interceptor before flowing into the main system. Runoff from the building is to be directed to roof gutters before flowing into either external rainwater pipes or internal siphons, discharging into the main system. The car park to the front of the building is constructed from permeable block paving. Additional depth of stone and or Tanks are provided under the car park to provide the required attenuation volume for the whole sub-catchment. All runoff is directed towards the car park and discharged at a controlled rate into the existing watercourse.
- 3.5 Flood compensation basins are created in order to provide additional flood storage volume on-site as detailed in the Flood Risk Assessment (FRA). These are to be constructed in a similar manor to attenuation basins with, maximum 1:3 banks to encourage plants and wildlife to live and grow, enhancing biodiversity, while providing practical flood storage. Landscape embankments are constructed to raise the development above the 1 in 100 + climate change level plus 300mm freeboard (64.49m). These building plateaus are provided in order to protect the development and direct surface water into landscape areas away from the development.

4 Off-Site Drainage Features

- 4.1 The following items are to be adopted by the local authority (Cherwell District Council) at final S278 Sign off and are subject to separate management and maintenance regime to normal highway standards and specifications:
- A new vegetated roundabout and widening to existing Wendlebury Road where storm water is intercepted by gullies or kerb drains. Storm water conveyance is then via underground pipes into a new swale. Final discharge from the swale is into an existing ditches adjacent to Wendlebury road and discharge is near greenfield runoff rates via small diameter pipe. Improvements to watercourses as required.
 - A new 3m wide footway connection adjacent to Wendlebury Road, Garden Centre and the A41. Run-off generated by the new footpath will drain into existing drainage systems locally via new gullies fitted during Section 278 works.
 - A new entrance/exit bell mouth for the David Lloyd development drained via gullies into the existing ditch adjacent to Wendlebury Road.
- 4.2 The following items are to be solely managed and maintained by David Lloyd:
- New asphalt car park is to be drained via gullies into underlying stone blankets or varying thickness. French drains are provided near tennis courts to feed into stone blankets.
 - Roof water is conveyed into underground pipes before being stored in a Geocellular Tank located under the Dome.
 - Both the car parks and roof water is then released into the Catalyst Bicester system via a flow control hydro brake device at an agreed maximum rate of 60 litres /second.

5 Traditional Drainage – Maintenance Schedule

- 5.1 The drainage elements are designed to cater for 1 in 30-year storm conditions without any flooding. In order to ensure that no contamination enters the water courses, silt traps and petrol interceptors are provided at appropriate positions. The main SuDS features have been designed to cater for the 1 in 100-year storm conditions with overland flows directed away from buildings. In designing the System due reference has been given to the CIRIA SuDS Manual, 2015.
- 5.2 **Gullies** - Inspect and de-sludge at least once a year.
- 5.3 **Line Drains** – Inspect and de-sludge silt boxes as necessary. Maintain strictly in accordance with the Manufacturer’s instructions but at least once a year. Check slotted grating for any blockages removing as necessary.
- 5.4 **Kerb Drains** – Inspect and de-sludge silt boxes as necessary. Maintain strictly in accordance with the Manufacturer’s instructions but at least once a year. Check openings for any blockages removing as necessary.
- 5.5 **Catch Pits** - Inspect and de-sludge at least once a year.
- 5.6 **Petrol Interceptors** – Maintain strictly in accordance with the Manufacturer’s instructions but at least once each year. Major refurbishment should be considered on a 15-year cycle, if required.
- 5.7 **Pipe Works** – Inspect and jet clean as necessary but at least once each year.
- 5.8 **Headwalls/Outlets** – These must be inspected and cleaned as necessary but at least twice each year. All gratings/screens and fixings should be checked and secured as necessary.
- 5.9 **Hydro-Brakes** – Before the product is commissioned, any debris or silt should be removed. Any visible fixing bolts should be checked. The control can be inspected internally and cleaned out by opening the inspection bypass door on the upstream end. Inspections should be carried out at frequent and regular intervals (approximately every 3-6 months) to the Manufacturer’s instructions.
- 5.10 **Landscaping** – The landscaping is to be planted/managed/maintained as attached Landscape Management & Maintenance Plan which can be found in **Appendix B**.

6 Swales – Maintenance Schedule

Swales are linear, flat bottomed grassed or vegetated channels that convey water from one place to another which can also store water and allow it to soak into the ground. Maintenance of swales is relatively straightforward for landscape contractors. Adequate access is provided in the design of the swales for appropriate equipment and vehicles.

The major maintenance requirement for dry swales is mowing. Mowing should ideally retain grass lengths of 75-150mm across the main “treatment” surface, to assist in filtering pollutants and retaining sediments. However, longer vegetation lengths, where appropriate, are not considered to pose a significant risk. Grass clippings should be disposed appropriately away from the swale (SuDS Manual, 2015).

Table 1 – Operation and maintenance requirements for swales

Maintenance schedule	Required action	Typical frequency
Regular Maintenance	Remove litter and debris	Monthly, or as required
	Cut grass – to retain grass height within specified design range	Monthly (during growing season), or as required
	Manage other vegetation and remove nuisance plants	Monthly, or as required
	Inspect inlets, outlets and overflows for blockages, and clear if required	Monthly
	Inspect infiltration surfaces for ponding, compaction, silt accumulation, record areas where water is ponding > 48 hours	Monthly, or as required
	Inspect vegetation coverage	Monthly for 6 months, quarterly for 2 years, then half yearly
	Inspect inlets and facility surface for silt accumulation, establish silt removal prog.	Half yearly
Occasional Maintenance	Reseed areas of poor vegetation growth, alter plant types to better suit conditions, if required	As required, or if bare soil if exposed over 10% of swale area
Remedial Actions	Repair erosion or other damage by re-turfing or reseeding	As required
	Relevel uneven surfaces and reinstate design levels	As required
	Scarify and spike topsoil layer to improve infiltration performance, break up silt deposits and prevent compaction of soil surface	As required
	Remove build-up of sediment on upstream gravel trench, flow spreader or at top of filter strip	As required
	Remove and dispose of oils or petrol residues using safe standard practices	As required

7 Storage Basins – Maintenance Schedule

Basins, ponds and wetlands are depressions in the ground where water is stored and treated. Water levels rise after rain and then drops to the normal level as the excess soaks into the ground or is released slowly to a watercourse or drain. Some water maybe held back as a pond for final treatment, amenity or wildlife interest.

The major maintenance requirement for storage basins is mowing. Mowing should ideally retain grass lengths of 75-150mm across the main “treatment” surface. Regular mowing in and around basins is only required along maintenance routes, amenity areas (e.g. footpaths), across any embankment and across the main storage area. The remaining areas can be managed as “meadow” unless otherwise required.

Table 2 – Operation and maintenance requirements for Storage Basins

Maintenance schedule	Required action	Typical frequency
Regular Maintenance	Remove litter and debris	Monthly
	Cut grass – for spillways and access routes and/or meadow grass in basin	Monthly (during growing season), or as required
	Manage other vegetation and remove nuisance plants	Monthly, (at start then as required)
	Inspect inlets, outlets and overflows for blockages, and clear if required	Monthly
	Inspect banksides, structures, pipework etc. for evidence of physical damage	Monthly
	Inspect inlets and facility surface for silt accumulation, establish silt removal prog.	Half yearly
	Check any penstocks and other mechanical devices	Annually
	Tidy all dead growth before start of growing season	Annually
	Remove minor sediments from inlets, outlets and forebays	Annually
	Manage wetland plants in outlet pool - where provide	Annually
Occasional Maintenance	Reseed areas of poor vegetation growth	As required
	Prune and trim any trees and remove cuttings	Every 2 years
	Remove major sediment from inlets, outlets forebay and main basin when required	Every 5 years
Remedial Actions	Repair erosion or other damage by re-turfing or reseeding	As required
	Relevel uneven surfaces and reinstate design levels	As required
	Realignment of rip-rap	As required
	Repair/restore of inlets, outlets and overflows	As required

8 Pervious Pavements – Maintenance Schedule

Permeable surfaces such as permeable block paving, porous Asphalt, gravel or free draining soils that allow rain to percolate through the surface into underlying drainage layers. They must be protected from silt, sand, compost, mulch, etc. Many of the specific maintenance activities can be undertaken as part of a general site cleaning contract.

Generally, pervious pavements require less frequent gritting in winter to prevent ice formation. There is also less risk of ice formation after snow melt, as the melt water drains directly into the underlying sub-base. A slight frost might occur on block paving.

Table 3 – Operation and maintenance requirements for Pervious Pavements

Maintenance schedule	Required action	Typical frequency
Regular Maintenance	Initial inspection	Monthly for three months after installation
	Inspect for evidence of poor operation and/or weed growth – if required, take remedial action	Three-monthly, 48h after large storms in first six months
	Inspect silt accumulation rates and establish appropriate brushing frequency's	Annually
	Monitor inspection chambers	Annually
	Brushing and vacuuming (Standard cosmetic sweep over whole surface)	Once a year, after autumn leaf fall, or reduced based on manufacturers recommendations – pay particular attention to areas where water runs onto pervious surface from nearby impervious area as this area is most likely to collect the most sediment
Occasional Maintenance	Stabilise and mow contributing and adjacent areas	As required
	Removal of weeds or management using glyphosphate applied directly into the weeds by an applicator rather than spraying	As required – once per year on less frequently used pavements
Remedial Actions	Remediate any landscaping which, through vegetation maintenance or soil slip, has been raised within 50mm of the level of paving	As required
	Remedial work to depressions, rutting and cracked or broken blocks considered detrimental to the structural performance or a hazard to users	As required
	Rehabilitation of surface and upper substructure by remedial sweeping	Every 10 to 15 years or as required (if infiltration performance is reduced due to significant clogging)

9 Geocellular Tanks – Maintenance Schedule

Attenuation storage tanks are used to create a below-ground void space for the temporary storage of surface water before controlled release. The storage system for this site is formed using reinforced concrete tanks fully sealed and water proofed. This system has been designed for use under areas trafficked by occasional large vehicle and Refuse Lorry.

The major maintenance requirement for attenuation storage tanks is inspection and monitoring to ensure long-term operation of below-ground storage tanks. Where the actions listed below do not improve performance of the tank then usually there may not be many other options than to completely replace the tank in a failure scenario.

Table 1 – Operation and maintenance requirements for Attenuation Storage Tanks

Maintenance schedule	Required action	Typical frequency
Regular Maintenance	Inspect and identify any areas that are not operating correctly. If required, take remedial action.	Monthly for 3 months, then annually
	Remove debris from the catchment surface (where it may cause risks to performance)	Monthly
	Inspect/check inlets, outlets, overflows and vents to ensure that they are in good condition and operating as designed	Annually
	For systems where rainfall infiltrates into the tank from above, check surface of filter for blockage by sediment, algae or other matter; remove and replace surface infiltration medium as necessary	Annually
	Remove sediment from pre-treatment structures and/or internal forebays	Annually, or as required
Occasional Maintenance	Remove major sediment from inlets, outlets, vents or inspection chambers	Every 2 years, or as required
	Survey inside of tank for sediment build-up and remove if necessary	Every 5 years, or as required
Remedial Actions	Repair/rehabilitate inlets, outlets, overflows and vents	As required

10 Management Guidance

10.1 The following details can be found in **Appendix A**:

- Details of the site that identifies runoff sub-catchments, SuDS components, critical water levels, control structures, flow routes (including exceedance routing) and outfalls.

10.2 The following details can be found in **Appendix B**:

- The landscaping plan, regime, planting schedule and maintenance & management plan. This is provided by the landscape architect and is to be read and implemented in conjunction with the recommendations in this report.

10.3 The following details can be found in **Appendix C**:

- The access that is required to each surface water management component for maintenance purposes and a plan for the safe and sustainable removal and disposal of waste periodically arising from the drainage system.
- The maintenance specification details the materials to be used and the standard of work required. The specification describes how the work should be carried out and contains clauses giving general instructions to the maintenance contractor.
- The maintenance checklist itemises the tasks to be undertaken and the frequency at which they should be performed so that an acceptable long-term performance standard is secured. This schedule can then be priced, checked on site and form the basis of an inspection log where appropriate. The checklist should act as a living document as it may change, where inspections advise changes to the scheme maintenance requirements.

10.4 The following details can be found in **Appendix D**:

- Photographic records of the inspections to be used by the management company. This can pick up long-term changes that might not be apparent on a single visit, especially where inspections are carried out by different members of staff.

10.5 The following details can be found in **Appendix E**:

- A CCTV drain survey is an in-depth inspection of your drainage system using specially designed CCTV cameras. CCTV drain surveys also allow for the easy identification and surveying of potential problems that may arise from your drains. This section has been provided for the management company to use to keep goof records.

10.6 The appointed management company will be fully responsible for all maintenance works. The management company shall appoint a professional management surveying company to ensure all infrastructure and SuDS are properly maintained and managed.

11 Spillage – Emergency Action

- 11.1 Most spillages on development sites are of compounds that do not pose a serious risk to the environment if they enter the drainage in a slow and controlled manner with time available for natural breakdown in a treatment system. Therefore, small spillages of oil, milk or other known organic substances should be removed where possible using soak mats as recommended by the Environment Agency with residual spillage allowed to bio-remediate in the drainage system.
- 11.2 In the event of a serious spillage, either by volume or of unknown or toxic compounds, then isolate the spillage with soil, turf or fabric and block outlet pipes from chamber(s) downstream of the spillage with a bung(s). (A bung for blocking pipes may be made by wrapping soil or turf in a plastic sheet or close woven fabric.)

Contact the Environment Agency immediately.

12 Queries Regarding Design Features

In the event of a concern or failure of a SuDS design feature contact:

Bailey Johnson Hayes Ltd
Suite 4, Phoenix House,
63 Campfield Road,
St. Albans,
Hertfordshire,
AL1 5FL

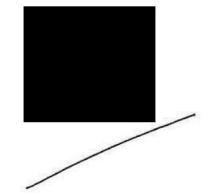
Tel: (01727) 841172

Email: wb@bjh.co.uk or james.griffiths@bjh.co.uk

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J Griffiths,
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On behalf of Bailey Johnson Hayes



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W Bailey C.Eng.,
F.I.Struct.E., M.I.C.E.
On behalf of Bailey Johnson Hayes

Bailey Johnson Hayes
Consulting Engineers
S1502/May 2024

APPENDIX A

Drainage Layout Plans, Easement Plans and SuDS Details

Provided by Bailey Johnson Hayes

Drainage Notes

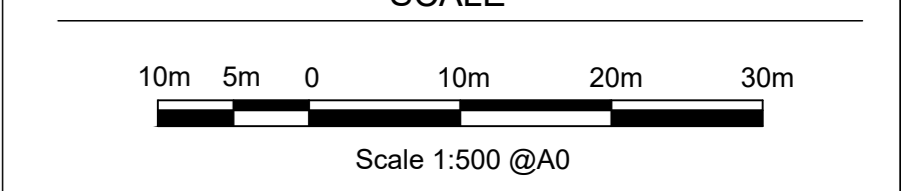
- This drawing is to be read in conjunction with all relevant Architects and Bailey Johnson Hayes drawings and specifications.
- Do not scale. Work only to figured dimensions.
- All dimensions and condition of existing drainage to have invert levels confirmed on site prior to commencement of work.
- Proposed Site Finishes Plan from Cornish Architects - Drawing Ref: 23018 - WD - 101 - Rev D Topographical Survey by MK Surveys Limited. Drawing Ref: 25646 (Rev 1) - Topographical Survey
- All works to Adopted Sewers to be carried out in accordance with the requirements of Sewers for Adoption in the Sewerage Sector Guidance v2.2 (2022) and the Adopting authority requirements.
- All private drainage is to be constructed in accordance with the Building Regulations as current at construction.
- Drains to be 'Hepworth Supersewer' or similar approved. Laid in Class S Bedding to BS 821:1985 Table 4, or to BS 8301:1985 Appendix D. 450mm Diameter Drains and above are to be Hepworth Concrete Pipes Class H or similar approved drains within the site may be different main accordance with Sewerage Sector Guidance v2.2 (2022).
- All trenches within trafficked areas to be backfilled with 75mm down graded stone fill, placed and compacted in 150mm layers. All pipes in Roadways / Parking, less than 900mm deep to pipe crown to be encased in concrete and flexible joints provided at 3000mm centres.
- All drains to have Class S granular bed and surround, except where:
 - Cover beneath roads or handstanding is less than 900mm to Pipe Crown or
 - Cover beneath landscaping is less than 600mm in which case Class Z (Concrete) bedding / surround is required.
- All Manholes greater than 1.5m to soffit to be constructed in Precast Concrete Rings to BS 5911: Part 1. Rings to be bedded in sealant strips unless otherwise noted in Manhole Schedule.
- Manholes in footpaths or landscaped areas to be backfilled with 40mm down graded stone fill, compacted in layers not exceeding 150mm thick. All manholes beneath roads and parking areas to be cased in minimum 150mm concrete surround.
- All connections to rain water pipes to be provided with Rooding access.
- All road gullies to be Hepworth Road Gullies, Ref 214 RGR4 with 150mm diameter outlets or similar approved. Gullies to be encased in minimum 150mm concrete.
- Drains under buildings and within 300mm of the underside of floor slab to be encased in 150mm concrete. Casing to incorporate flexible fibre board joints at spacings as recommended by the pipe manufacturer. Drains under buildings
- Architect is to provide final rain water pipe positions for construction.
- All Pipes to enter manhole with Soffits Level unless otherwise stated. See manhole details drawings for further clarity of connections.

LEGEND

- INDICATES SURFACE WATER MANHOLES
- INDICATES SURFACE WATER PIPE RUNS
- INDICATES LAND DRAINAGE PIPE RUNS
- INDICATES INDICATIVE DAVID LLOYD DRAINS
- INDICATES LINEAR DRAINAGE CHANNELS
- INDICATES ROAD GULLIES
- INDICATES SUBGRADE STONE TANK
- INDICATES ATTENUATION BASINS

ALL PIPES CONNECTED DIRECTLY INTO GULLIES TO BE 150MM DIAMETER (COLOURED MAGENTA ON PLAN)

SCALE



ADDITIONAL NOTES

- NOTE: DAVID LLOYD SW DRAINAGE DESIGNED AND CONSTRUCTED BY OTHERS. RESTRICTED TO 60 US INTO CATALYST BICESTER SW SCHEME
- NOTE: DRAINAGE IS A MIXTURE OF INVERT & SOFFIT MANHOLE DESIGN. SEE BJH MANHOLE DETAILS FOR SPECIFIC PIPE INLET/OUTLET LEVELS
- NOTE: ALL RWP PIPE POSITIONS TO BE AGREED WITH THE ARCHITECT

INFORMATION

Rev	Date	Revision Description
D	23.04.24	SW Drainage updated to latest layout
C	23.11.22	Updated to latest Masterplan layout
B	08.11.22	SW Drainage updated to latest layout
A	01.06.22	Updated to latest Architects Layout

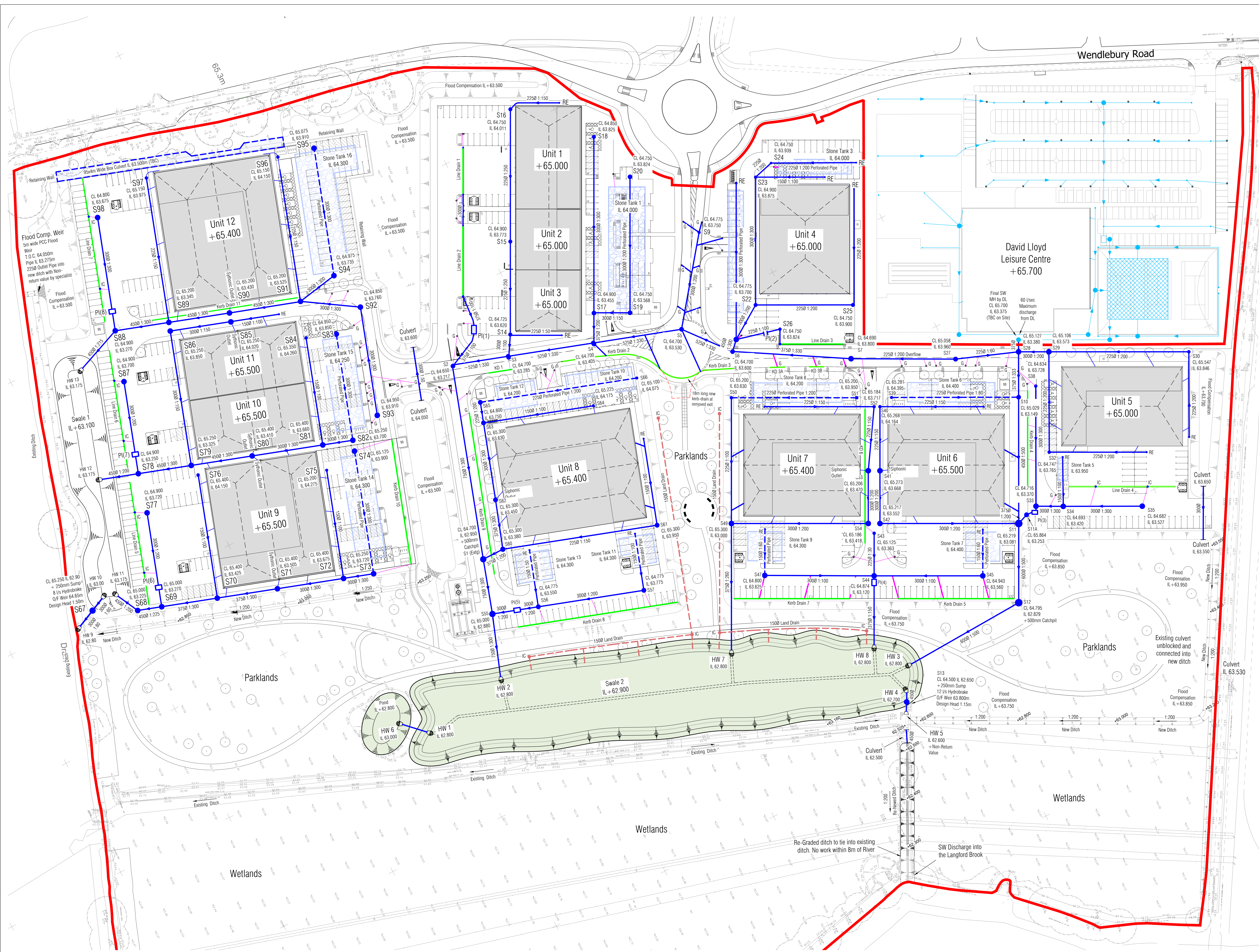
Project Title
Catalyst Bicester
Wendlebury Road, Bicester



Drawing Title
MASTERPLAN
SW Drainage Layout

BAILEY JOHNSON HAYES
Consulting Engineers

Scale	1:500 @A0	Drawing Number	S1358-Ext-63 D
Date	08.10.21	Drawn	JNG

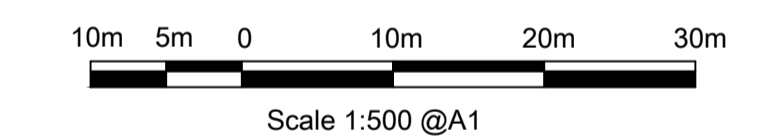


SW Drainage Layout 1:500

DRAINAGE NOTES

- This drawing is to be read in conjunction with all relevant Architects and Bailey Johnson Hayes drawings and specifications.
- Do not scale. Work only to figured dimensions.
- All dimensions and condition of existing drainage to have invert levels confirmed on site prior to commencement of work.
- Proposed Site & Finishes Plan from Cornish Architects:- Drawing Ref: 23022 - TP - 002 Rev - Topographical Survey by MK Surveys: Drawing Ref: 33239 Rev 1
- All works to Adopted Sewers to be carried out in accordance with the requirements of Sewers for Adoption in the Sewerage Sector Guidance v2.2 (2022) and the Adopting authority requirements.
- All private drainage is to be constructed in accordance with the Building Regulations as current at construction.
- Drains to be 'Hepworth Supersleeve' or similar approved Laid in Class S Bedding to BS 882 1983: Table 4, or to BS 8301 1985: Appendix D. 450mm Diameter Drains and above are to be Hepworth Concrete Pipes Class H or similar approved drains within the site may be different main accordance with Sewerage Sector Guidance v2.2 (2022).
- All trenches within trafficked areas to be backfilled with 75mm down graded stone fill, placed and compacted in 150mm layers. All pipes in Roadways / Parking, less than 900mm deep to pipe crown to be encased in concrete and flexible joints provided at 3000mm centres.
- All drains to have Class S granular bed and surround, except where:
 - Cover beneath roads or hardstanding is less than 900mm to Pipe Crown or,
 - Cover beneath landscaping is less than 600mm in which case Class Z (Concrete) bedding / surround is required.
- All Manholes greater than 1.5m to soffit to be constructed in Precast Concrete Rings to BS 5911: Part 1. Rings to be bedded in sealant strips unless otherwise noted in Manhole Schedule.
- Manholes in footpaths or landscaped areas to be backfilled with 40mm down graded stone fill, compacted in layers not exceeding 150mm thick. All manholes beneath roads and parking areas to be cased in minimum 150mm concrete surround.
- All connections to rain water pipes to be provided with Rodding access.
- All road gullies to be Hepworth Road Gullies, Ref 214 RGR4 with 150mm diameter outlets or similar approved. Gullies to be encased in minimum 150mm concrete.
- Drains under buildings and within 300mm of the underside of floor slab to be encased in 150mm concrete. Casing to incorporate flexible fibre board joints at spacing's as recommended by the pipe manufacturer. Drains under buildings
- Architect is to provide final rain water pipe positions for construction.
- All Pipes to enter manhole with Soffits Level unless otherwise stated. See manhole details drawings for further clarity of connections.

SCALE



TOWN PLANNING

D	09.05.24	Issued for Planning Submission
C	26.04.24	Vegetation retained + Ditches updated
B	19.04.24	Issued for Planning Submission
Rev	Date	Revision Description

Revision Schedule

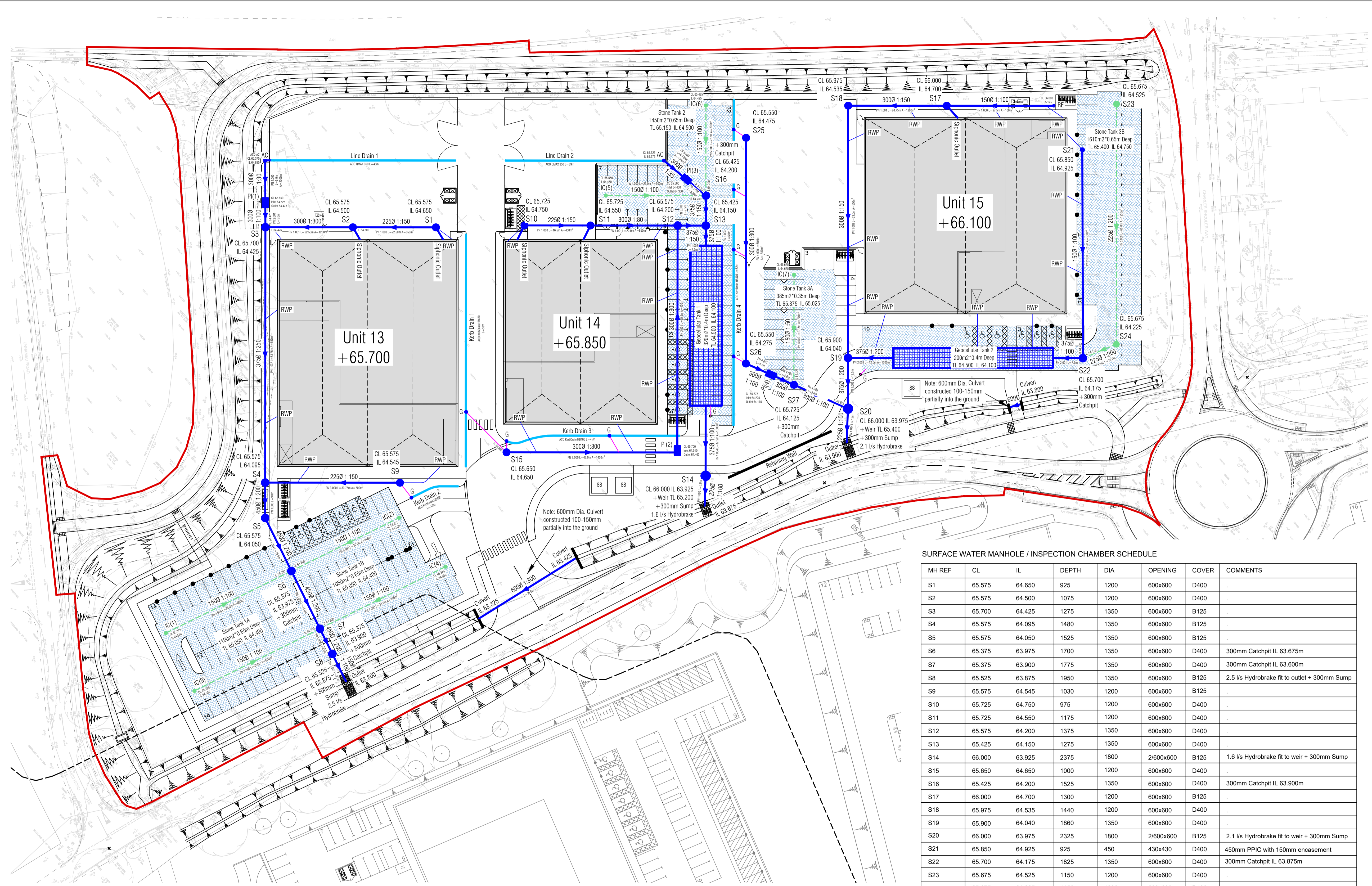
Project Title
**Catalyst Bicester Phase 4,
Wendlebury Road, Bicester**



SW Drainage Layout

BAILEY JOHNSON HAYES
Consulting Engineers
ST. ALBANS: Suite 4, Phoenix House, 63 Campfield Rd, ST. ALBANS, Herts AL1 5FL

Scale	1:500 @A1	Drawing Number	S1502-02 D
Date	03.04.24	Drawn	JNG



SURFACE WATER MANHOLE / INSPECTION CHAMBER SCHEDULE

MH REF	CL	IL	DEPTH	DIA	OPENING	COVER	COMMENTS
S1	65.575	64.650	925	1200	600x600	D400	
S2	65.575	64.500	1075	1200	600x600	D400	
S3	65.700	64.425	1275	1350	600x600	B125	
S4	65.575	64.095	1480	1350	600x600	B125	
S5	65.575	64.050	1525	1350	600x600	B125	
S6	65.375	63.975	1700	1350	600x600	D400	300mm Catchpit IL 63.675m
S7	65.375	63.900	1775	1350	600x600	D400	300mm Catchpit IL 63.600m
S8	65.525	63.875	1950	1350	600x600	B125	2.5 l/s Hydrobrake fit to outlet + 300mm Sump
S9	65.575	64.545	1030	1200	600x600	B125	
S10	65.725	64.750	975	1200	600x600	D400	
S11	65.725	64.550	1175	1200	600x600	D400	
S12	65.575	64.200	1375	1350	600x600	D400	
S13	65.425	64.150	1275	1350	600x600	D400	
S14	66.000	63.925	2375	1800	2600x600	B125	1.6 l/s Hydrobrake fit to weir + 300mm Sump
S15	65.650	64.650	1000	1200	600x600	D400	
S16	65.425	64.200	1525	1350	600x600	D400	300mm Catchpit IL 63.900m
S17	66.000	64.700	1300	1200	600x600	B125	
S18	65.975	64.535	1440	1200	600x600	D400	
S19	65.900	64.040	1860	1350	600x600	D400	
S20	66.000	63.975	2325	1800	2600x600	B125	2.1 l/s Hydrobrake fit to weir + 300mm Sump
S21	65.850	64.925	925	450	430x430	D400	450mm PPIC with 150mm encasement
S22	65.700	64.175	1825	1350	600x600	D400	300mm Catchpit IL 63.875m
S23	65.675	64.525	1150	1200	600x600	D400	
S24	65.675	64.225	1450	1200	600x600	D400	
S25	65.550	64.475	1075	1200	600x600	D400	
S26	65.550	64.275	1275	1200	600x600	D400	
S27	65.725	64.125	1900	1200	600x600	D400	300mm Catchpit IL 63.825m
IC (1)	65.375	64.550	825	450	430x430	D400	450mm PPIC with 150mm encasement
IC (2)	65.375	64.500	875	450	430x430	D400	450mm PPIC with 150mm encasement
IC (3)	65.375	64.550	825	450	430x430	D400	450mm PPIC with 150mm encasement
IC (4)	65.375	64.550	825	450	430x430	D400	450mm PPIC with 150mm encasement
IC (5)	65.550	64.450	1100	450	430x430	D400	450mm PPIC with 150mm encasement
IC (6)	65.425	64.425	1000	450	430x430	D400	450mm PPIC with 150mm encasement
IC (7)	65.675	64.675	1000	450	430x430	D400	450mm PPIC with 150mm encasement

PETROL INTERCEPTOR SCHEDULE

TANK REF	DRAIN AREA	PRODUCT	LENGTH	DIAMETER	INLET	OUTLET	COMMENTS
PI(1)	200m2	NSBP006*	2254mm	1354mm	64.525m	64.475m	300mm Concrete Encased + Alarm
PI(2)	1400m2	NSBP006*	2254mm	1354mm	64.510m	64.460m	300mm Concrete Encased + Alarm
PI(3)	1100m2	NSBP006*	2254mm	1354mm	64.400m	64.350m	300mm Concrete Encased + Alarm
PI(4)	1850m2	NSBP006*	2254mm	1354mm	64.225m	64.175m	300mm Concrete Encased + Alarm

*Product range from Marsh Industries Hydrooil Bypass Separator Range or similar approved

LEGEND

- INDICATES SURFACE WATER MANHOLES
- INDICATES SURFACE WATER PIPE RUNS
- INDICATES PERFORATED COLLECTION PIPES
- INDICATES LINEAR DRAINAGE CHANNELS
- INDICATES ROAD GULLIES / OUTLET GULLIES
- INDICATES UNBOUND CGA STONE TANK

ALL PIPES CONNECTED DIRECTLY INTO GULLIES TO BE 150MM DIAMETER (COLOURED MAGENTA ON PLAN)

Note: - See BJH Section 278 Plans & Details for the off-site highway drainage to Wendlebury Road, A41 and associated cycle/footways

CATCHMENT UNIT 13	CATCHMENT UNIT 14	CATCHMENT UNIT 15
STONE 1A - 316 m3	STONE 2 - 405 m3	STONE 3A - 60 m3
STONE 1B - 293 m3	TANK 1 - 122 m3	STONE 3B - 467 m3
TOTAL = 609 m3	TOTAL = 527 m3	TANK 2 - 76 m3
TOTAL = 609 m3	TOTAL = 527 m3	TOTAL = 603 m3
QBAR OUTLET = 2.5 l/s	QBAR OUTLET = 1.6 l/s	QBAR OUTLET = 2.1 l/s
IMP. AREA = 0.750 ha	IMP. AREA = 0.650 ha	IMP. AREA = 0.750 ha
TOTAL = 1.000 ha	TOTAL = 0.650 ha	TOTAL = 0.850 ha

Note: - Geocellular tanks to be Hewitech Variobox or similar approved. Tank is to be provided with geotextile protection fleece, impermeable geomembrane, air vents, inlets and outlets to specialist providers details. Tank is to be installed in strict accordance with manufactures instructions. Structural integrity to be checked and approved before construction.

APPENDIX B

Landscape Maintenance Plan

Read in conjunction with SuDS plan



Landscape and Ecology Management Plan

**Catalyst, Bicester,
Units 5, 6, 7, 8 and 9– RM4**

08th December 2022
LBLA Report No. LB291/R03c/AL/DB

Report No:	Date	Revision	Author	Checked
LB291/R03	03.05.22	-	David Bailey CMLI	Andrew Laird CMLI
LB291/R03a	31.05.22	a		
LB291/R03b	15.11.22	b		
LB291/R03c	08.12.22	c		

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Plans:

LB291_D04b: RM4 - Soft Landscape Proposals (Sheets 1-4)
11920_P08b_Ecological Enhancement Plan



Section 1: Introduction

Purpose

- 1.1 This Landscape Management Plan (LMP) has been prepared by Laird Bailey Landscape Architects (LBLA) on behalf of Albion Land for Catalyst, Bicester, Units 5, 6, 7, 8 and 9 (hereafter referred to as the 'site'). The site is centred on OS grid reference SP575210.
- 1.2 The purpose of the LMP is to provide details of measures to ensure the successful establishment and ongoing maintenance of the soft and hard landscape elements of the development proposals.
- 1.3 This LMP should be read in conjunction with drawings LB291_D04b – RM4 – Soft Landscape Proposals (Sheets 1-4).

Scope of the Landscape Management Plan

- 1.4 This Landscape Management Plan is set out as follows:
 - Section 2 sets out relevant standards and legislation;
 - Section 3 describes the site, and provides an overview of the existing landscape and its condition;
 - Section 4 describes the proposed soft landscaping typologies;
 - Section 5 describes the proposed hard landscaping typologies;
 - Section 6 sets out the long-term design objectives;
 - Section 7 sets out the management regimes and responsibilities;
 - Section 8 sets out the maintenance operations for all the soft landscape areas; and
 - Section 9 sets out the maintenance operations for all the hard landscape areas.



Section 2: Technical and Environmental Considerations

- 2.1 The contractor shall familiarise themselves and their operatives with all British Standards and regulations, as referred to in this document, and any subsequent revisions thereof. All chemical weed control must be carried out by suitably trained staff in accordance with the manufacturers recommendations and the legislation set out below.
- 2.2 The Contractor must only use chemicals specifically approved for the purpose for which it is intended as dictated by the Control of Pesticides Regulations 1986 and the conditions of approval for the chemicals and any relevant code of practice issued by DEFRA. The Contractor will consider in every instance whether the use of chemicals is strictly necessary before application.

Relevant Standards and Legislation	
ISO 7851	Classification scheme for fertilizers and soil conditioners
BS4428	Code of practice for general landscape operations
BS 5837	Trees in relation to design, demolition and construction Recommendations
3882:2015	Topsoil
The Food and Environment Protection Act (1985)	
The Control of Pesticides Regulations 1986 (COPR) (as amended 1997)	
The Control of Substances Hazardous to Health Regulations (2002)	
The Environment Protection Act (1990)	



Section 3: Site Overview of Existing Landscape and its Condition

Site Context

- 3.1 The site is located to the southern edge of Bicester, Oxfordshire. The site is proposed for five units (Units 5, 6, 7, 8 and 9), associated landscaping and highways.
- 3.2 The site currently comprises of grazing pasture and vegetated field boundaries with a series of drainage gully's which serve surrounding agricultural land. Soft landscaping elements are mainly contained to the site's peripheries with an internal hedgerow and tree planting dissecting a portion of the site. The sites western boundary is open with phase 1 of the Catalyst development beyond which is flanked by Wendlebury Road and a belt of existing trees. To the north lies a series of existing industrial units and a row of trees. To the east a continuous buffer of mature trees and water course and to the south a vegetated field boundary comprising trees and hedgerow beyond which lies agricultural land.
- 3.3 The character of the site is semi-urban with a mix of built development and agricultural land surrounding the site in all directions.



Section 4: Proposed Soft Landscaping

4.1 This LEMP is to read in conjunction with details of proposed soft landscaping (see LBLA Drawing No. LB291_D04b – RM4 – Soft Landscape Proposals (Sheets 1-4).

4.2 Soft landscaping within the site is designed to:

- Create an attractive and appropriate setting for the new Industrial Units (5a, 5b and 6), providing all year-round interest and colour.
- Create a strong soft landscape framework with planting to the perimeter of the site including trees, selected to maximise biodiversity;
- Ensure trees and shrubs are managed appropriately to promote the growth of flowers, berries and general 'form' offering the maximum benefit of amenity/habitat for birds, small mammals, and insects, and;
- Provide additional habitats for bats and nesting birds.

4.3 Proposed soft landscaping elements and planting consists of the following.

Trees

4.4 A selection of native trees, planted at a range of appropriate sizes (ranging between selected standard up to semi mature) will feature across the scheme.

Native Woodland Planting

4.5 In addition to specimen trees, a native woodland mix of feathered trees, whips and transplants shall be planted at an approximate density of 1 plant/1.5msq. Over time this will form a dense understorey screen to larger tree specimens, contributing to the overall bio-diversity value and visual mitigation/amenity, reducing visual coalescence between the built form.

Native Shrub Mix and Native Hedgerow

4.6 Featuring within the development and upon the site boundaries, creating a series of green corridors linking to the wider landscape fabric. Hedgerows will consist of a variety of native species (typically those which are prevalent in the local area) planted as double staggered rows at 5 plants per linear meter.

Wetland/Scrapes

4.7 An area of Wetland/Scrapes are to be implemented within the southern area of the site. This area is to consist of shallow depressions with gently sloping edges, which holds a varying degree of water throughout the year. Proposed scrapes create in-field wet features that are attractive to wildlife, as well as supporting a wide variety of invertebrates and provide important feeding areas for breeding and wading birds.



Amenity Shrub Planting

- 4.8 This consists of species which are mainly evergreen and offer all year-round seasonal interest. Specimens will be chosen due to their hardiness/robustness and need for minimal maintenance/management once established. Ultimately, mature sizes will range between 0.3m-1.5m in height. It has also been deemed important that the majority should be flowering species to provide added bio-diversity value and a food source for pollinators.

Wildflower Meadow Mix

- 4.9 Wildflower areas will be limited to the outer perimeters of the development and mainly form a successional buffer to understorey woodland and native hedgerows. Seed mixes will consist of a range of shade tolerant non-invasive grass and long-lasting wildflowers, offering maximum benefits to bees, butterflies, birds, and small mammals.

Amenity Grass Mix

- 4.10 Amenity grass areas will be provided around buildings and for verges flanking access roads and pedestrian paths throughout the site.

Swale Meadow Grass Mix

- 4.11 This is to be implemented on the margins/banks of swales and scrapes, both planted with a wetland meadow mix (Emorsgate EM8 composed of 20% wildflowers and 80% slow growing grasses).



Section 5: Proposed Hard Landscaping

- 5.1 This LEMP is to read in conjunction with details of proposed hard landscaping (see relevant Cornish Architects drawings).
- 5.2 Hard landscaping within the site is designed to:
- Create an attractive and appropriate setting for the new Industrial units (5, 6, 7, 8 and 9), providing hard landscape which is fit for purpose, durable and robust;
 - Indicate change in use, identifiable from other hard surfaced areas; and
 - To provide a pallet of materials which are aesthetically and visually appropriate for the various settings and uses within the development.

Tarmacadam Road and Bitmac Footway Surfacing

- 5.3 Tarmac surfaces are to be built to the given build-up specification and executed to a high standard. All bound surfaces will be edged accordingly to maintain crisp lines and the structural integrity of the surface build-up.

Concrete Block Paving to Parking Spaces/circulation and footpaths

- 5.4 Parking spaces, vehicular areas of circulation and footpath are to be laid to concrete blocks differentiating these spaces from main highways within the site and each other. All concrete block surfaces will be edged accordingly to maintain crisp lines and the structural integrity of the surface build-up.

Brushed Concrete Yards

- 5.5 Unit yards to be laid to brushed concrete for functional purposes. All brushed concrete surfaces will be edged accordingly to maintain crisp lines and the structural integrity of the surface build-up.



Section 6: Long-term Design Objectives

Existing Trees and Hedgerows

- 6.1 Management of existing trees, hedgerows and shrubs offers to secure the current landscape elements that have potential for enhancement without compromising other important aims of the development.
- 6.2 Specific objectives include:
- Ensuring long-term enhancement of trees and hedgerows with additional native planting and 'gapping-up' where required;
 - Maintaining long-term health of existing trees and hedgerows to contribute to buffering the development from neighbouring land and infrastructure;
 - To extend the life of mature trees through sound arbouricultural management; and
 - Creating a healthy tree and shrub understorey to knit into the proposed soft landscaping proposals, offering a series of mature/interconnected wildlife corridors
- 6.3 Any tree/hedgerow works such as the removal of hazardous branches or the felling of mature trees will be completed outside of the active period for breeding birds (generally understood as March to August inclusive but some bird species may nest all year round). Should any management be required within the breeding bird period, checks for nesting birds by a suitably trained ecologist will take place prior to any works commencing to ensure that no breeding birds are present. Should a nest be present then a suitable buffer would be installed until the nest is confirmed as being inactive.
- 6.4 Checks for the presence of roosting bats would also be completed prior to management taking place regardless of the time of year. Potential bat roosting features can include woodpecker holes, rot holes, any cracks or splits in the tree bark, cankers, gaps between overlapping stems or branches, partially detached ivy (with stem diameters in excess of 50mm), and man-made holes. If any of the potential bat roosting features are identified, evidence of roosting bats is identified or a bat is found, then works would temporarily stop and an licenced ecologist/Natural England consulted.

Proposed Trees and Native Woodland Planting

- 6.5 The long-term design and management objective is to ensure that on-site trees thrive and contribute to an attractive environment. Trees shall be managed to develop to a healthy and even form. Stems should only be removed so as to retain the natural appearance of the individual plant species or to remove broken or badly damaged branches and dead wood. Tree surgery such as crown lifting should be carried out as required to prevent restriction to pedestrians or vehicles.



- 6.6 Any tree works will have consideration for the potential presence of roosting bats and breeding birds as per the management considerations stated within the retained tree prescriptions above.
- 6.7 Watering operations will be carried out as specified in this management plan.
- 6.8 Irrigation timing and frequency will take into account the prevailing weather conditions, soil moisture release, response of the tree species to water deficits or prolonged soil saturation. The holding capacity of the soil and amount of water available to the tree to be assessed at each visit. Frequency of watering is more important than the volume and should be undertaken as required. Monitoring is recommended when 10 consecutive days at 25 degrees is recorded during the growing season. Water should only be added if the probe / tensiometer values indicate that it would be appropriate to do so.
- 6.9 All trees to be in compliance with BS8545: 2014 Trees: from Nursery to independence in the landscape – Recommendations. Staked trees will be inspected at each maintenance visit, and any trees which have died or are excessively damaged will be removed from site, complete with the stake, and the ground reinstated.
- 6.10 Mulched areas around trees will be maintained to an acceptable standard (75mm in 1m circumference around stem).

Existing and Proposed Native and Amenity Shrub Planting

- 6.11 The long-term design objective of the shrub planting is to ensure the plants thrive to create shrubbery for local amenity and habitat for wildlife. Planting will be managed to achieve a maximum height of 2.5 metres. Pruning should be undertaken to promote flowering and fruiting in accordance with the species and age of the plant.
- 6.12 As such, any management will take place at the end of the winter months to avoid the active period for most wildlife, providing the plants with time to produce flowers, seeds and berries. Should any management be required within the breeding bird season (March and August inclusive), checks for nesting birds will take place prior to any works commencing by a suitably qualified ecologist. Should a nest be present then a suitable buffer would be installed until the nest is confirmed as being inactive. Any vegetation management will have consideration for the potential presence of breeding birds as per the management considerations stated above.

Proposed Native Hedgerow

- 6.13 Hedgerows are to be incorporated into the southern area of the site delineating the access pathway from the ecological habitat area as shown on the planting plan. The hedgerow should create a physical barrier to discourage access to the ecological planting to the south and provide an attractive edge to the car park and access path. The creation of hedgerow will also increase connectivity of the site for wildlife and provide additional foraging and nesting habitat for a variety of species.



- 6.14 Hedgerow planting will be managed to achieve a maximum height of 1.2m.
- 6.15 The ground around the hedgerow transplants will be bark mulched to conserve moisture and reduce weed growth.
- 6.16 Careful trimming and pruning will be required in the early years to ensure the development of a well-clothed hedge. Trimming should aim to form an 'A' profile.
- 6.17 Any hedgerow management will have consideration for the potential presence of breeding birds as per the management considerations stated above.

All Hedging

- 6.18 Inspect monthly for the first year and maintain shrubs/hedging in a weed free condition through combined techniques by hand, herbicides, cultivation and mulching.
- 6.19 Prune or clip to promote bushy, healthy growth and required shape when necessary.
- 6.20 Trimming back of growth overhanging adjacent footpaths or windows when required.
- 6.21 Remove/replace individual specimens as required.

Wetland/Scrapes

- 6.22 Once scrapes are created, it is important to maintain open, muddy margins where wading birds can find and access food. If the margins become too overgrown with plants such as rush, wader use will decline rapidly. If possible, allow livestock to graze and poach the margins at low levels, and do not fence the scrape off. Scrape margins should be managed by mowing each year to maintain access for waders and other animals. Maintain a small proportion of longer marginal vegetation to provide additional habitat variety, which will benefit invertebrates and plants and provide cover for offspring.
- 6.23 Where vegetation is to be cut back this should be completed in September/October to avoid any impacts to breeding birds and also any impacts to potentially over wintering waterfowl.

Proposed Wildflower Meadow Mix, Amenity Grass Mix and Hedgerow Margins

- 6.24 Management aims to increase structural diversity and species composition both in a manner compatible with user's amenity requirements and with the needs of fauna such as invertebrates, reptiles, birds and foraging bats. The management objectives are as follows:
- Secure foraging habitats for wildlife without disturbance by retaining grassland within root protection areas of retained hedgerows and trees;
 - Provide structured mosaics varying from regularly mown amenity grassland to wildflower and grass edges cut on less frequent mowing rotations;



- Enhance species composition in the seeding mix by specifying a species-rich wildflower and grassland mix for the public open space and hedgerow margins.

6.25 Amenity grass will be cut to a height of 50mm monthly during the growing season with arisings removed. Proposed wildflower meadow and hedgerow margins would be cut back once a year in late August and early September, left for a minimum of 3 days and then arisings removed, thus allowing the majority of the grassland plants to bloom and set seed.

Proposed Swale Meadow Grass Mix

6.26 Wetlands and other aquatic environments on site will aim to provide a unique habitat for thousands of species of aquatic and terrestrial plants and animals. Equally wetlands, swales and attenuation basins will offer flood protection and water quality improvement as well as a valuable, aesthetically pleasing, recreational resource. This would be cut back annually as per the prescription for Wildflower Meadow.

Improve Opportunities for Bats

6.27 The retention of hedgerows on site in conjunction with the new hedgerow and tree planting will maintain and enhance the foraging and commuting opportunities for bats across the site and to the wider area. The provision of wildflower grassland, wetland scrapes and swale planting will also provide foraging opportunities for some bat species.

6.28 Additional roosting opportunities are proposed in order to provide further ecological enhancement for bats post-development. This will include the installation of eleven bat boxes across the Catalyst Bicester Phase 2.1 site (Vivaro Pro or similar). The boxes should be placed as high as possible (3 m and above), ensuring the entrance is free from obstruction. Favoured sites are close to linear features along the hedge line on suitable retained trees and away from street lighting. See ecological enhancement plan (Ref: 11920_P08b) for suggested specification and location of bat boxes.

6.29 The bat boxes are designed to be low maintenance and the only monitoring which should be completed after Year 1 is to confirm that the spec and location is appropriate.

Improve Opportunities for Birds

6.30 The creation and appropriate management of new native shrub, hedgerow, wetland scrapes and tree planting will provide and overall enhancement to bird foraging and nesting resources within the site post-development.

6.31 To provide an additional enhancement for birds, eleven bird boxes will be erected on suitable retained trees. Boxes will be positioned so they are sheltered from prevailing wind, rain and strong sunlight, normally facing north through to east at a height of between 2m and 5m, ensuring a clear flight path to the entrance. See ecological enhancement plan (Ref: 11920_P08b) for suggested specifications and location of bird boxes.



- 6.32 All boxes should be Vivara Pro or a similar product made from woodcrete as these are known to be durable, long-lasting and to regularly attract birds to nest.
- 6.33 A bespoke swift tower will also be installed in the Parklands area (see plan ref: 11920_P08b) for the estimated location. The swift tower will be mounted on a telegraph or metal pole. The specification will be as per the following:
- Lowest swift box at least 7m from ground level;
 - Clear flyway in front of and below the nest chamber entrances;
 - Minimum of 10 x nest chambers;
 - Each nest chamber should have dimensions of 200mm width, 400mm length, and 200mm height;
 - Next entrances should be 30mm x 65mm to exclude larger bird species;
 - Long lasting weatherproof materials should be used;
 - Rough materials should be used for the interior and exterior of the nest chambers to ensure swifts can obtain a grip with their claws; and
 - An anti-squirrel baffle should be placed at the bottom of the pole to prevent potential predation.
- 6.34 All boxes and the swift tower should be annually inspected for presence, damage, obstruction and if necessary, should be cleaned. Inspection and cleaning should be conducted annually during the winter months to avoid impact to nesting birds. If replacement through loss or damage is required, it should be for an identical product positioned in the same or a similar location.



Section 7: Management Regimes and Responsibilities

- 7.1 The landscaping works will receive post installation maintenance for a one-year defects liability period (DLP). All defects resulting from plant loss, disease, or failure will be replaced on a like for like basis. A visit every month, or more frequently should watering be required, is recommended during the DLP. Subsequently a minimum of 12 maintenance visits per annum is recommended.
- 7.2 Maintenance and management activities are set out below (which covers a minimum period of five years) to ensure the soft landscaping is managed effectively beyond the time limits of the implementation and establishment works. The responsibility for this management and maintenance is to be agreed. LBLA's recommendation is for the landscape contractor that undertakes the planting works to be engaged to carry out the one-year establishment maintenance.
- 7.3 Management and maintenance operations will be monitored and reviewed annually on an on-going basis and where required, modified if the operations and frequencies set out do not deliver the required results or meet the specific aims and objectives.
- 7.4 As a minimum, maintenance visits should be undertaken to inspect, monitor as well as to carry out routine operations, including weeding and litter picking, with other specific operations being undertaken as scheduled below.
- 7.5 The appointed Contractor must provide details of all necessary insurances and certification to carry-out the works specified in this management plan. It is the responsibility of the appointing authority to ensure that all submitted insurances and certificates are up to date and provide the appropriate level of cover for the specified works.
- 7.6 Defects in the landscape are identified early and addressed promptly.



Section 8: Soft Landscaping Maintenance Works Schedule

Component	Task	Time of Year	Frequency
<p><i>Visits every month throughout the one-year defects and establishment period, more frequently if required due to prologued dry weather conditions and the need for watering. Subsequently management and maintenance operations will be monitored and reviewed annually on an on-going basis and where required modified if the operations and frequencies set out do not deliver the required results or meet the specific aims and objectives.</i></p>			
Trees & Native Woodland Planting	Prune and repair wounds in accordance with good horticultural and arboricultural practice.	Oct-Feb	As required (annually).
	Check the ties regularly for rubbing and adjust if necessary. Constriction of the stem by ties happens very quickly, so fast-growing trees need frequent checking. After bad weather, check for abrasion and snapped stakes or ties. Re-firm tree by adjusting tree ties and ensuring soil is re-firmed around the base.	All year round and especially after strong winds, frost heave and other disturbances.	As required (annually).
	Hand weed mulched areas around trees.	Mar-Sep	Every visit.
	Apply suitable non-selective herbicide to control weeds.	Mar/Oct	Only if required.
	Replace any failed specimens.	Oct-Mar	As required during the one-year DLP (next available planting season).
	Remove debris/litter	Throughout	Every visit.



Component	Task	Time of Year	Frequency
	Top up bark mulch around bases of trees to full depth of 75mm.	Mar/Apr	As required during the DLP.
	Newly planted trees will be watered throughout May-August months after any period of four weeks without significant rain to thoroughly wet the top 150mm of soil around the tree roots.	Throughout	As required after a period of four weeks without significant rainfall.
	Trimming and selective thinning of the canopy. Trim back growth overhanging adjacent footpaths when required.	Oct-Mar	Annually if required.
	In years 2 and onwards remove staking if tree has established well and the stakes are no longer required.	Any	As required.
Amenity Shrub Planting	Trimming and reshaping to encourage healthy bushy growth. Trim back growth overhanging adjacent footpaths when required.	Oct-Mar	Annually if required.
	Hand weed.	Throughout	Every visit.
	Apply suitable non-selective herbicide to control weeds.	Apr-Sep	Only if required.
	Remove debris/litter.	Throughout	Every visit.
	Replace any failed specimens.	Oct to March	Within the DLP, as required (next available planting season).



Component	Task	Time of Year	Frequency
	Top up bark mulch around bases of shrubs to full depth of 75mm.	Apr	As required during the DLP.
	Watering of newly established shrubs.	Throughout	As required after a period of four weeks significant rainfall, during the DLP.
Native Hedgerows/ Native Shrub Mix	Re-shaping.	Hard-prune Oct-Feb	Annually if required.
	Hand weed.	Throughout	Monthly/every visit.
	Apply suitable non-selective herbicide to control weeds.	Apr-Sep	As required.
	Apply fertiliser: Slow release, applied as per manufacturer's recommendations.	Mar/Apr	Annually.
	Remove debris/litter.	Throughout	Monthly/every visit.
	Replace any failed specimens.	Oct-Mar	As required (next available planting season).
	Top up bark mulch hedge base to full depth of 75mm.	Apr	Annually.
	Watering of newly established hedgerows.	Throughout	As required after a period of four weeks without significant rainfall.
	Trim and top hedgerow as necessary avoiding bird nesting season.	Feb	As required (annually).



Component	Task	Time of Year	Frequency
Wetland/ Scrapes	During the first year allow annual weeds to establish to protect seed stock. Cut, compost and remove in August. In subsequent years mow meadow margins to 50mm.	August	Once per year. Leave hay cuttings to drop seed for minimum of 3 days (up to 7) before removing.



Component	Task	Time of Year	Frequency
	Aquatic plant management/thinning	August to October	Aquatic plant thinning should be carried out on a 3-year cycle to halt the natural succession process and ensure an open body of water maintained.
	Clearance of debris/ rubbish	Throughout	Water bodies to be regularly checked for rubbish or other detritus material. Any rubbish to be cleared by hand and removed from site
	Dredging and silt removal	September to October	It is recommended that attenuation basins/ ponds are de-silted on a 5–7 year cycle. Silt should be carefully removed by mechanical means (typically a long arm dredging excavator) and deposited and spread along the bank margins dependant on the volume removed.



Component	Task	Time of Year	Frequency
Wildflower Meadow Mix	Mowing/stripping.	Late Aug/early Sep	Cuttings must be left for a minimum period of 3 days before being raked up and removed, to allow wildflowers to bloom and disperse seeds
	Weeding.	Throughout	Monthly/every visit. Weeds exceeding 75mm and which don't feature in the seed mix should be removed.
	Re-seeding (if required).	Sep	Any bare patches of ground where seed has failed to germinate should be re-seeded as per the original specification.
Amenity Grass Mix	Mowing and removal of arisings.	Mar-Oct	Monthly/every visit. Grass should be mown regularly to aid with establishment to a height of 50mm.
	Clearance of debris/rubbish	Throughout	Water bodies to be regularly checked for rubbish or other detritus material. Any rubbish to be cleared by hand and removed from site.



Component	Task	Time of Year	Frequency
Swale Meadow Grass Mix	Weed control.	Mar-Sep	Invasive weeds to be spot treated with a glyphosate herbicide applicator. Herbicide must not be applied within 2m of attenuation or swale bank if permanent standing water is present. Any weeds within this 2m zone or on sloping banks should be removed by hand or mechanically.
	Aquatic planting management/thinning.	Sept-Oct	Aquatic plant thinning should be carried out on a 3-year cycle to halt the natural succession process and ensure an open body of water maintained.
	Weeding.	Mar-Sep	Invasive weeds to be spot treated with a glyphosate herbicide applicator. Herbicide must not be applied within 2m of attenuation or swale bank if



Component	Task	Time of Year	Frequency
			permanent standing water is present. Any weeds within this 2m zone or on sloping banks should be removed by hand or mechanically.
Improve opportunities for bats	Installation of bat boxes on suitable retained trees to include a range of different aspects (mainly to the south or west, but providing a variety of different positions to offer a range of climatic conditions). Boxes should be placed as high as possible (3m and above), ensuring the entrance is free from obstruction. To be installed as development progresses in accordance with the approved phasing plans for the site.	During construction phase	Once
	After Year 1, a check would be completed to ensure that they have been installed in the correct/optimal locations. Bricks / boxes should then be checked annually for presence, damage and obstruction.	Anytime	Annually



Component	Task	Time of Year	Frequency
Improve opportunities for birds	<p>Installation of bird boxes on suitable retained trees to include a range of different aspects (between north and east, but providing a variety of different positions to offer a range of climatic conditions). Boxes should be placed as high as possible (2m and above), ensuring the entrance is free from obstruction.</p> <p>Swift tower with at least 10 x nest chambers and mounted on a metal/wooden pole to be installed in the parklands area.</p> <p>To be installed as development progresses in accordance with the approved phasing plans for the site.</p>	During construction phase	Once
	All boxes and the swift tower should be inspected annually for presence, damage, obstruction and if necessary, should be cleaned. Inspection and cleaning should be conducted during the winter months to avoid impact on nesting birds.	Oct-March	Annually



Section 9: Hard Landscaping Maintenance Works Schedule

Component	Task	Time of Year	Frequency
<p><i>Visits every month throughout the one-year defects and liability period. Management and maintenance operations will be monitored and reviewed annually on an on-going basis and where required modified if the operations and frequencies set out do not deliver the required results or meet the specific aims and objectives.</i></p>			
Hard landscape surfaces	Weeding/litter picking/sweeping.	Throughout	Hard surfaces within external areas should be maintained in a clean and tidy appearance free from weeds and litter. This will include general sweeping, weeding and occasional spray of surfaces as required.
	Repairs to cracked or worn surfaces.	Throughout/weather permitting	Hard landscape road and footways should be checked quarterly; any areas of wear that may become a safety concern should be assessed and repaired.



Component	Task	Time of Year	Frequency
Street Furniture	Check/assessment of street furniture.	Throughout	Undertake regular checks, maintenance, and repairs as necessary to ensure furniture and boundary treatment remains safe, in a usable condition and in a good state of repair. Empty litter bins at intervals appropriate to level of use.
	Litter collection.	Throughout	Empty litter and dog bins at intervals appropriate to level of use.

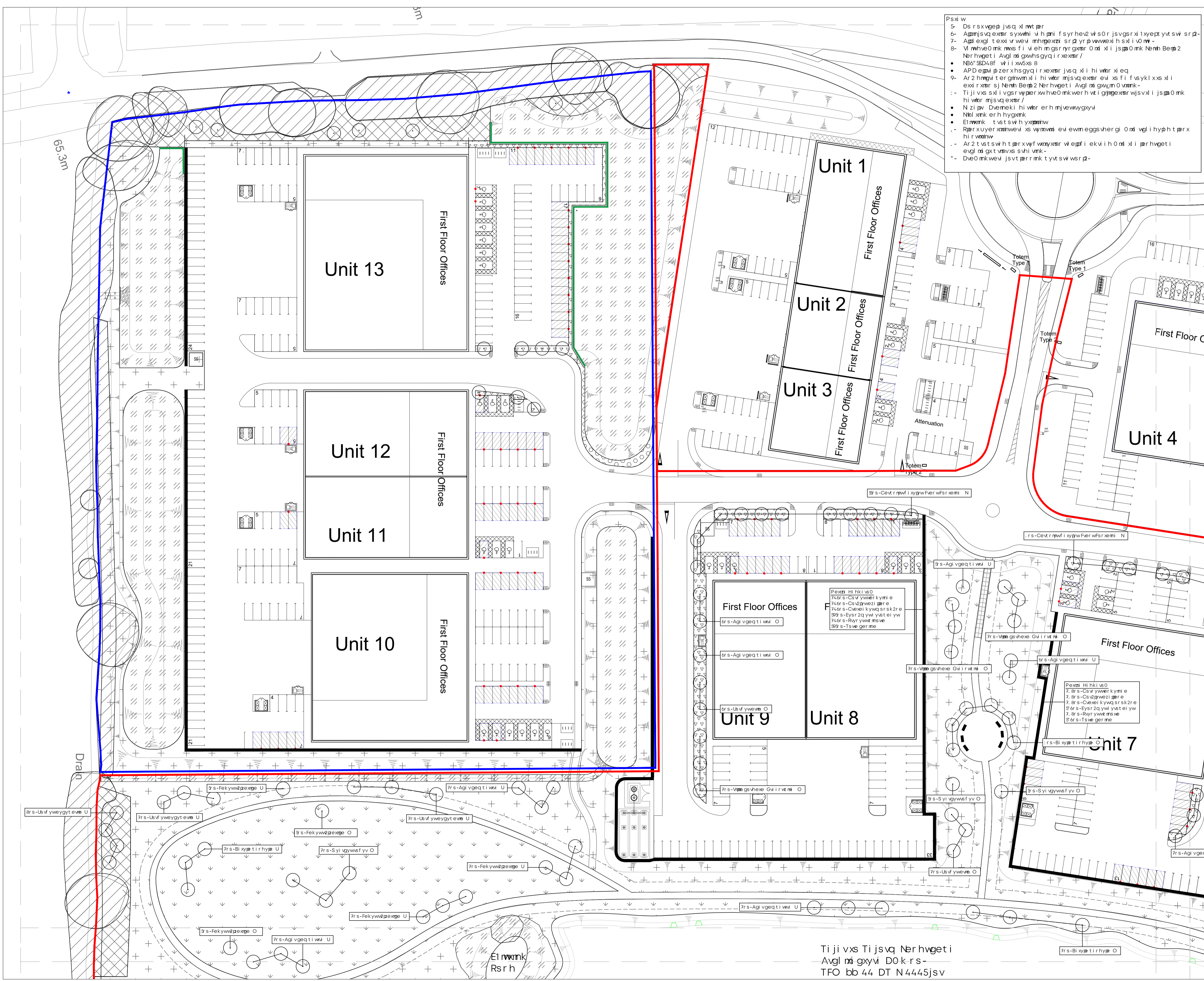


Plan:

LB291_D04b – RM4 - Soft Landscaping Proposals (Sheets 1 – 4)

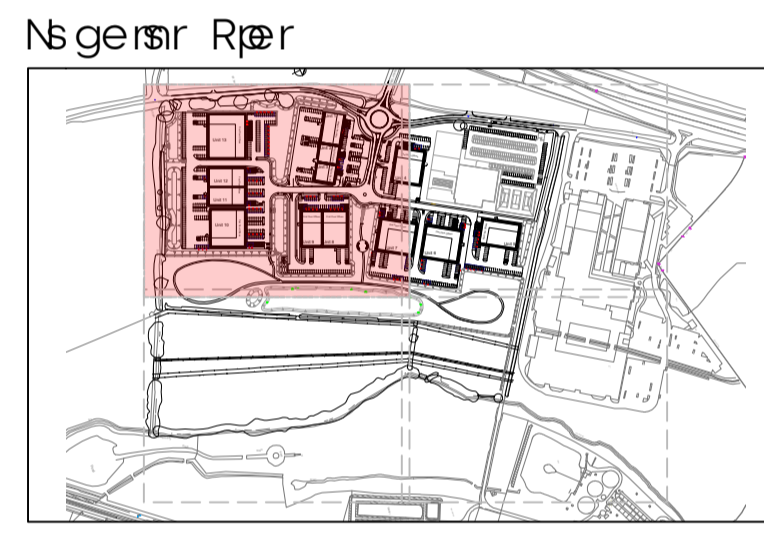
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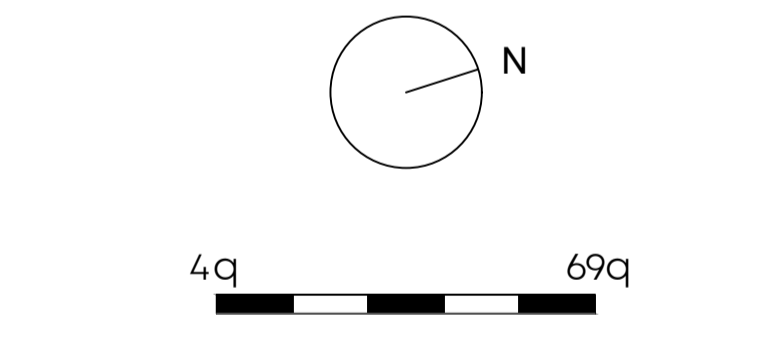


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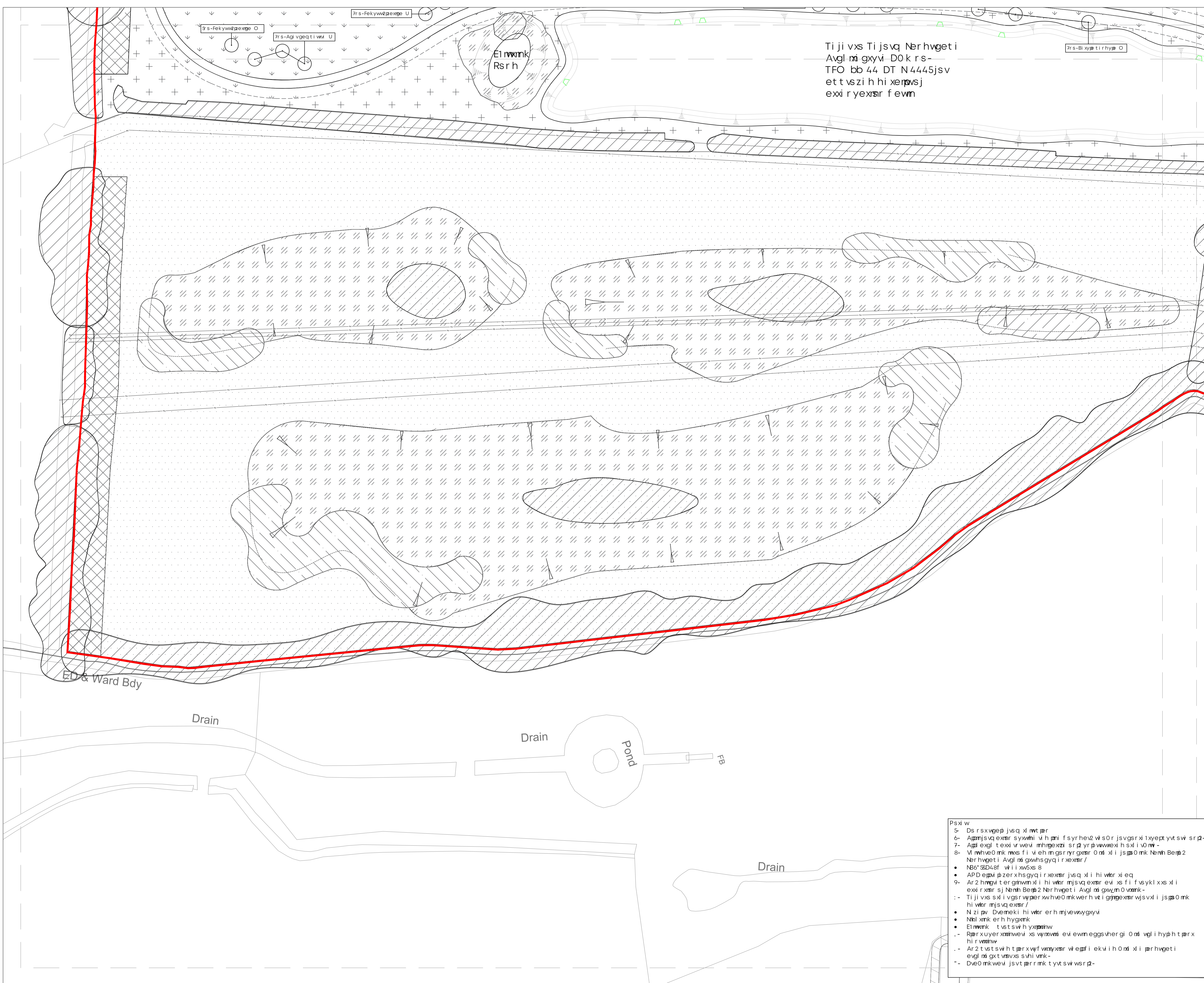
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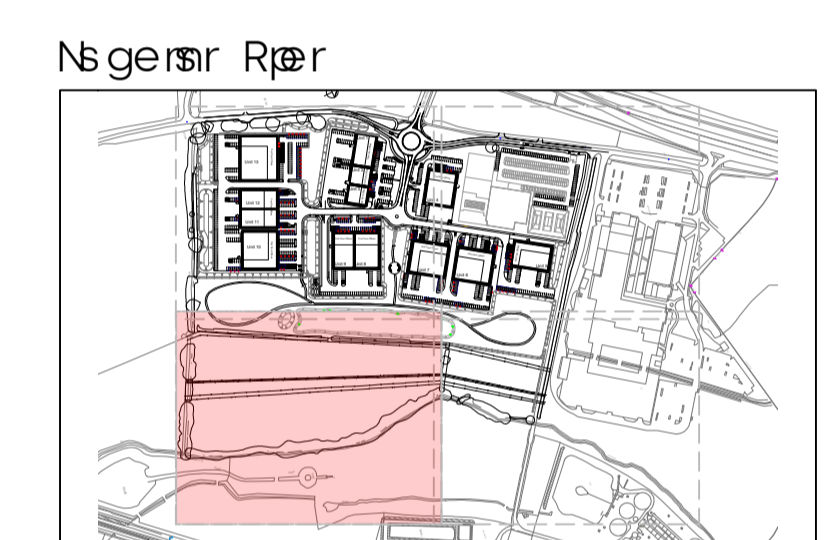
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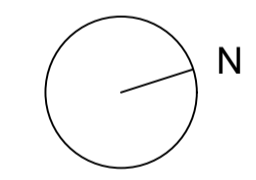


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LAIRD BAILEY
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Legend

Ecological Enhancements

Bat Boxes

-  Vivara Pro Harlech Box
-  Vivara Pro Large Multichamber

Bird Boxes

-  Woodstone Alicante Open Nest Box
-  Woodstone Seville 32mm Box
-  Woodstone Seville 28mm Box
-  Swift Nest Box Tower

Swift Box

Bespoke Swift Tower mounted on a telegraph or metal pole. Specification will be as per the following:

- Lowest box at least 7m from ground level;
- Clear flyway in front of and below the nest chamber entrances;
- Minimum of 10 x nest chambers;
- Each nest chamber should have dimensions of 200mm width, 400mm length, and 200mm height;
- Next entrances should be 30mm x 65mm to exclude larger bird species;
- Long lasting weatherproof materials should be used;
- Rough materials should be used for the interior and exterior of the nest chambers to ensure swifts can obtain a grip with their claws; and
- An anti-squirrel baffle should be placed at the bottom of the pole to prevent potential predation.



Project	Bicester Gateway
Drawing Title	Ecological Enhancemnet Plan
Scale	As Shown (Approximate)
Drawing No.	11920/P08b
Date	November 2022
Checked	WW/AG



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APPENDIX C

Material Specification and Maintenance Checklist Log

(To be Completed at Handover)

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Appendix B: Maintenance inspection checklist



Table B.25 SuDS maintenance inspection checklist			
General information			
Site ID			
Site location and co-ordinates (GIS if appropriate)			
Elements forming the SuDS scheme		Approved drawing reference(s)	
Inspection frequency		Approved specification reference	
Type of development		Specific purpose of any parts of the scheme (eg biodiversity, wildlife and visual aspects)	

Inspection date								
	Details	Y/N	Action required	Date completed	Details	Y/N	Action required	Date Completed
General inspection items								
Is there any evidence of erosion, channelling, ponding (where not desirable) or other poor hydraulic performance?								
Is there any evidence of accidental spillages, oils, poor water quality, odours or nuisance insects?								
Have any health and safety risks been identified to either the public or maintenance operatives?								
Is there any deterioration in the surface of permeable or porous surfaces (eg rutting, spreading of blocks or signs of ponding water)?								

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Appendix B: Maintenance inspection checklist



Silt/sediment accumulation								
Is there any sediment accumulation at inlets (or other defined accumulation zones such as the surface of filter drains or infiltration basins and within proprietary devices)? If yes, state depth (mm) and extent. Is removal required? If yes, state waste disposal requirements and confirm that all waste management requirements have been complied with (consult environmental regulator)								
Is surface clogging visible (potentially problematic where water has to soak into the underlying construction or ground (eg underdrained swale or infiltration basin)?)								
Does permeable or porous surfacing require sweeping to remove silt?								
System blockages and litter build-up								
Is there evidence of litter accumulation in the system? If yes, is this a blockage risk?								
Is there any evidence of any other clogging or blockage of outlets or drainage paths?								
Vegetation								
Is the vegetation condition satisfactory (density, weed growth, coverage etc)? (Check against approved planting regime.)								
Does any part of the system require weeding, pruning or mowing? (Check against maintenance frequency stated in approved design.)								
Is there any evidence of invasive species becoming established? If yes, state action required								
Infrastructure								
Are any check dams or weirs in good condition?								
Is there evidence of any accidental damage to the system (eg wheel ruts?)								

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Appendix B: Maintenance inspection checklist



Is there any evidence of cross connections or other unauthorised inflows?								
Is there any evidence of tampering with the flow controls?								
Are there any other matters that could affect the performance of the system in relation to the design objectives for hydraulic, water quality, biodiversity and visual aspects? (Specify.)								
Other observations								
Information appended (eg photos)								
Suitability of current maintenance regime								
Continue as current Increase maintenance Decrease maintenance								
Next inspection								
Proposed date for next inspection								

APPENDIX D

Photographic Record File (To be added to as a live document)

For Management Use Only

APPENDIX E

CCTV & Drainage Surveys (To be added to as a live document)

For Management Use Only