

Long Term Monitoring and Maintenance Plan

River Academy, Reading

9 September 2024

Bowmer and Kirkland Limited

River Academy
Reading
RG1 8EQ



Document Control

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Distribution

Reading Borough Council
Bowmer and Kirkland Limited





1 Introduction

1.1. Authorisation

Ashfield Solutions Limited ("Ashfield") has been instructed by Bowmer and Kirkland Limited ("B+K or the Client"), to prepare a Long Term Management and Maintenance Plan to identify any monitoring and maintenance activities required for compliance with Condition 6 of planning permission (ref. 212061) granted by Reading Borough Council at the River Academy Development, Richfield Avenue, Reading, RG1 8EQ.

1.2. Background & Context

The new River Academy School has been constructed on a site known to have previously been subject to landfilling. As a result, a land contamination assessment and remediation strategy was undertaken to enable the development of the River Academy School. At the request of Reading Borough Council, a long-term plan has been prepared to identify any monitoring and maintenance activities that will be required in order to comply with Condition 6 of Planning Consent (ref. 212061).

The original planning consent (ref. 212061), granted by Reading Borough Council, was provided for the:

"demolition of existing driving range structures and the development of a new three-storey 8 form entry school for years 11- 16, including a SEND unit and 300 place 6th form (total school capacity of 1500 pupils) including the creation of a new access from Richfield Avenue, new parking area, cycle parking landscaped areas, external play areas, Multi Use Games Area (MUGA) and sporting pitches."

The following outlines the details of Condition 6 which is relevant to the long-term monitoring and maintenance of the site:

"6. Long Term Monitoring and Maintenance

Following the approval of the remediation verification report (see Condition 5) and prior to any part of the permitted development being brought into use a long-term monitoring and maintenance scheme with a timetable for the submission of reports on the effectiveness of the remediation over a period of 10 years starting from the date the verification report is approved shall be submitted to and approved in writing by the Local Planning Authority.

REASON: To ensure the development is suitable for its end use and the wider environment and does not create undue risks to occupiers of the site or surrounding areas in accordance with Policy EN16 of the Reading local plan 2019."

This report has been prepared in line with step 4 of stage 3 remediation and verification of the Land Contamination Risk Management (LCRM¹) guidance. The LCRM instructions for Step 4 are quoted as follows:

"You may need to do:

- *long term monitoring and maintenance if this was agreed as the remediation option*
- *post remediation monitoring and maintenance for further verification*
- *Use the monitoring objectives and criteria you set in the remediation strategy.*

¹ Land Contamination Risk Management (LCRM) Guidance (published on gov.uk)



- *You will need to:*
- *confirm who will carry out the work*
- *report your results*
- *decide and get agreement when monitoring or maintenance can stop*
- *Consider the frequency, scope and reporting requirements of the monitoring and maintenance. Make sure that:*
- *this is acceptable with regulators and stakeholders*
- *there are plans in place if monitoring criteria are not met*
- *access to carry out the work is still acceptable – for example, redevelopment may have changed access to plant or monitoring points*
- *any specialist skills for ongoing maintenance are in place if it cannot be done routinely*
- *there are adequate provisions for replacing consumables such as treatment chemicals*
- *power supplies are guaranteed and if emergency back-up is required*
- *any maintenance work items are fully specified, including actions, frequency, responsibility and the standard you aim to achieve*
- *there are reactive maintenance measures in place to deal with unexpected events such as emergencies, breakdowns, vandalism, accidents or extreme weather.”*

This document is to be submitted to Reading Borough Council, with the objective of facilitating the discharge of Planning Condition 6 relating to the development.

1.3. Monitoring and Maintenance Plan Structure

This report adopts the following structure:

- Section 1. This details the outline requirement for any monitoring and maintenance.
- Section 2. Details who will carry out the monitoring and maintenance works.
- Section 3. Presents contingency and mitigation measures for the long-term maintenance of the site.
- Section 4. Presents a timetable for frequency of monitoring and maintenance works required.

1.4. Objectives

Long-term monitoring and maintenance activities are required in order to ensure continued effectiveness of the adopted remedial activities in accordance with the original design and will set out procedures required for routine inspections of the school (including potential for nuisance odours, pitch condition, burrowing animals etc.) and mitigation thereof. These procedures are set out to manage and maintain the integrity of the underlying cover layer to ensure no damage is caused, thus exposing the underlying landfill.

The following maintenance procedures that need to be followed are:

- Gas Monitoring;
- Preserving the integrity of the capping layer;
- Inspections in the event of site flooding;
- Actions to be taken in the event of odours and;
- Procedures for the use of grassed areas by the Reading Festival



1.5. Information Sources

The following documents have been used to aid this report:

- FS0949-ASO-XX-XX-RP-Y_0005 Remediation Strategy S3 P02
- FS0949-ASO-XX-XX-RP-Y-0002 Flood Response Plan S3 P02
- FS0949-ASO-XX-XX-RP-Y-0001 Flood Risk Assessment S3-P03
- Landscape Management Plan (Ref. FS0949-ALA-XX-00-RP-L-0003 (Planning Ref. 231481))



2 Site Setting

The 5-hectare (ha) site is located 1.5km to the northwest of Reading Town Centre, Berkshire RG1 8EQ, with the site centred on NGR 470413 174483. The site lies approximately 150m to the south of the River Thames with access gained directly off Richfield Avenue. The site location is shown in Drawing 01,

2.1. Surrounding Land Usage

- North: The site lies adjacent to Rivermead Park and Thameside Promenade public open spaces (the latter is mown grass area by the River Thames with specimen trees and a riverside tarmac surfaced public right of way). The River Thames is situated approximately 150m to the north of the site as a 60m wide navigable channel flowing west to east; there is residential land to the north of the Thames.
- West: The site is bordered by Cow Lane and agricultural hedge-lined fields/farmland; these fields are used by the Reading Festival. There is also a tree lined drainage channel adjacent to the northern part of the western boundary (outside the red-line planning area) that is fed by the east to west drainage ditch in the southern part of the site.
- East: Rivermead Leisure Centre (adjacent to southern part of eastern boundary) and Rivermead Park (adjacent to southern part of eastern boundary); Rivermead Park is also used for camping by the Reading Festival.
- South: The site is bordered by Richfield Avenue and the Cardiff Road mixed commercial, light industrial and retail area, with the east-west running Great Western mainline railway beyond. To the southeast lies Caversham Bridge Garden Centre.



3 Long Term Monitoring and Maintenance

Where remediation is undertaken which includes the construction of permanent structures, these may require maintenance to ensure their continued functionality. In this case, there are some long-term inspection requirements required to ensure other aspects of the remediation mitigation or this project. It is understood that maintenance tasks are to be undertaken by Maid Erleigh Trust. The following section outlines the contingency and mitigation measures in place for the long-term maintenance of the site. For information regarding frequency of inspections, see Table 2, Section 4 of the report.

3.1. Gas / VOC Protection

An assessment of the ground gas risk was undertaken by Ground Gas Solutions (“GGS”) in 2022, which identified hazardous ground gases including methane and carbon dioxide present at the site. However, it was concluded that elevated Volatile Organic Compounds (“VOCs”) and associated odour thresholds had the greatest risk potential.

Gas Mitigation Measures Employed

- Robust verification of the installation of gas/odour protection in buildings and compliance concentrations of gas/VOC vapours in subfloor voids below applicable criteria as determined by reassurance air quality monitoring.
- Mitigation shall be achieved through adoption of suitable vapour protection within the proposed buildings and buried services as necessary.
- Additionally, a ground gas retardation apron has been implemented to prevent accumulation of odours within the void space beneath the buildings.
- A 12-month compliance monitoring program is to be undertaken to prove measures are effective. If a decision is needed to be made to extend the monitoring program, this is to be determined by the appointed building health and safety representative in consultation with GGS. In the event that odours are detected post occupation, it is understood Bowmer and Kirkland will be the primary point of contact to deal with the issues for the first 12 months (further detailed in Section 3.2).

Protection of Gas Mitigation Measures

Given the mitigation measures utilised, any future digging/excavation work within the vicinity of school buildings and infrastructure must be completed under competent supervision to protect the integrity of the gas membrane cover. Care should be taken to prevent the damage or puncture of the installed measures. Figure 01 (below) provides example photographs of the geomembrane installed.



Figure 01 - Photographs of Geomembrane Cover



3.2. Ongoing Monitoring & Odour Identification

Following building completion, a monitoring period of a minimum of 12 months is to be progressed whereby gas/VOC monitoring shall be undertaken on a continuous or regular basis to ensure the mitigation measures installed are effective. Following school handover to the Maiden Erlegh Trust, it is the responsibility of the Maiden Erlegh Trust to undertake the required monitoring.

A Gas Monitoring Plan has been developed and is provided in Appendix A of this report.

In the event that odours are detected post occupation, it is understood Bowmer and Kirkland will be the primary point of contact to deal with / rectify the issue for the first 12 months, following this 12-month period, it is the responsibility of the Maiden Erlegh Trust.

If a decision is needed to be made to extend the monitoring program, this is to be determined by the appointed building health and safety representative in consultation with appointed specialist gas contractor.

Odour Identification

Whilst the potential for odours is very low, site staff (particularly maintenance staff that are to undertake regular checks of the site) are to be aware that, if present, any odours will most likely present as a rotten egg smell. On identifying such a smell, this should be reported and actions to investigate / rectify undertaken under advice from specialist gas contractors.

3.3. Cover System Design

Table 1 below details the cover systems in place and the excavation depths applied for the soft cover areas.

Table 1 - Cover Systems Overview

Location	Cover System Required
Sports pitches / running track	■ 200mm imported topsoil ■ 300mm subsoil



	■ The subsoil layer to comprise: (i) imported subsoil; and/or (ii) the existing site capping soils (in-part/all)
Grassed outfields	■ 150mm imported topsoil ■ 300mm subsoil ■ The subsoil layer to comprise: (i) imported subsoil; and/or (ii) the existing site capping soils (in-part/all)
Planted / landscaped areas	■ 150mm imported topsoil ■ 300mm subsoil ■ For areas of proposed trees, pits to be excavated and additional depth of subsoil provided as per the Landscape Architect's specification for tree pits.
Habitat Area (located in far NW corner of site)	■ 100mm crushed material 6-20mm; (may comprise adequately verified and inert building rubble inc. concrete, brick etc). For avoidance of doubt must be verified as asbestos free. ■ 200mm subsoil/ capping material ■ The subsoil layer to comprise: (i) imported subsoil; and/or (ii) the existing site capping soils (in-part/all)

Figure 02 below shows photographs of the imported soil used for the cover system.

Figure 02 - Photographs of Imported Soil for Cover System



3.4. Procedures and Mitigation Measures for the Protection of the Cover System

There should be no uncontrolled excavation works undertaken anywhere across the site. Restrictions on excavations are required to be in place as well as long term inspections and maintenance of the capping layer and gas membrane. Any excavations that are required to be undertaken should be tightly controlled by management procedures adopted by the school. Excavations that do take place, must be completed under watching brief by a competent geo-environmental consultant, in order to appropriately assess the potential for ground contaminants, particularly for excavations below 400mm.



As part of ongoing maintenance and management procedures to be implemented by the school, risk assessments and method statements will be developed for any works involving excavation works within the soft cover layer to ensure the cover layer is preserved and deeper landfill materials are not disturbed.

In order to maintain the soft cover areas (pitches, landscape areas), regular inspections are required to ensure its integrity. Maintenance includes ensuring vegetation is kept tidy and kept clear of drainage channels, gullies and ventilation ducts as well as visually identifying any clear and obvious damage to the pitch and landscape areas. Inspections should take place on a monthly basis but also following any extreme weather events where falling trees could cause damage to the area.

Any damage that does occur to the capping layer must be inspected for exposed landfill material and reinstated prior to re-occupation of the school as per the Remediation Strategy and Landscape Strategy.

Figure 03 shows photographs of landfill material to look out for. Signs of landfill material can include soil with exposed rubbish and general waste. If landfill material is detected, it must be cordoned off to protect school users and advice must be sought from an appropriately qualified and competent geoenvironmental consultant.

Figure 03 - Photograph of Landfill Material Present on Site



3.5. Vegetation Growth

With regards to the planting of fruit and vegetables, this should be avoided where possible to prevent disturbance of the cover layer and underlying landfill. In the event that vegetation is planted, a raised planter should be used to ensure adequate separation to the cover layer. It is also a requirement that commercially supplied soils are imported.

In areas where trees are planted, the capping layer consists of 150mm on topsoil and 300mm of subsoil. It is understood that trees have been planted using clean imported subsoil with an underground guying system and a



drainage layer consisting of a 300mm of clean gravel to ensure trees are not planted into the landfill mass itself. Trees should be regularly inspected to ensure that roots are not overgrown and to check for any further unforeseen risks. Signs for this can include exposed tree roots and cracks in the ground surface. Additionally, collapsed trees should be monitored as roots could rip up the cover layer, exposing landfill material. Signs of exposed landfill material includes rubbish and litter within the soil. Please refer to Figure 02 for a photograph of the landfill material.

3.6. Inspections and Cleaning in the Event of Site Flooding

Should flooding occur on site, it should initially be evaluated whether access has been fully re-established to the site. This should be undertaken in conjunction with the Environment Agency (EA), Emergency Services, Local Authority and any other party or stakeholder that has specialist knowledge on how the site operates.

Should severe damage have occurred as a result of flooding, the relevant person(s) should work alongside the Environment Agency and relevant authorities to establish whether it is safe to access the site. Additionally, inspection of all soft cover areas is required to assess its integrity. This includes ensuring no erosion or deposition of wastes from flood waters.

The ground beams/flood voids beneath the site have been designed to account for a potential flooding event. These comprise a series of low-level galleries which have a number of access portals for easy access. It is essential that these access points remain clear and easily accessible. In the unlikely event that a flood event occurs, jetting of the flood voids will be undertaken by a subcontractor to remove any blockages.

3.7. Procedures for the use of grassed areas by Reading Festival

Prior to the annual Reading Festival taking place in the vicinity of the site, procedures for the planned use of the grassed areas involve making sure the correct measures are in place for excavation works or any activity that could potentially disturb the land. This includes ensuring groundworkers undertaking the works do not damage the 600mm cover layer.

Any excavations that require disturbance to depths in excess of 500mm, should have appropriate supervision to ensure disturbance to the capping layer is minimised. In the event that contaminated material from the landfill is excavated, this should be disposed of appropriately with the relevant environmental authorities. Any vehicle and pedestrian movements during the preparation and during the festival should be on temporary trackways to prevent damage to the cover systems. Any damage that does occur must be reinstated prior to reoccupation of the school as per the Remediation Strategy and Landscape Strategy.

Post festival inspections must take place to check for blockages to the drainage channels and ventilation ducts. Additionally, any visual damage to the field following the festival. Examples of damage includes impact to the ground from tent pegs, evidence of fires that may have been started during the festival and the presence of litter and rubbish, particularly in the ventilation ducts and drainage channels that could cause blockages.

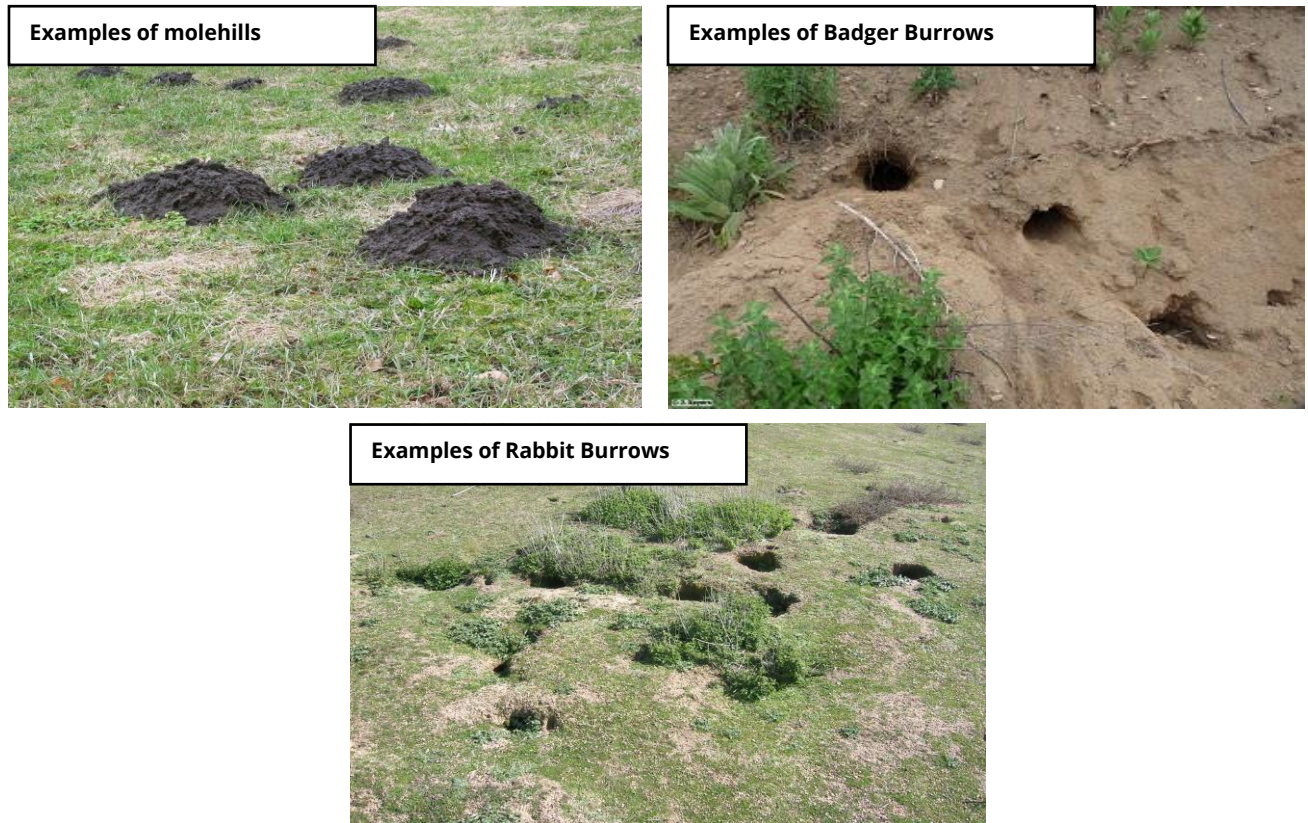
3.8. Burrowing Animals

With regards to burrowing animals, routine monthly inspections should be scheduled, as well as the infilling of burrows and adoption of standards pest control measures. Burrows are likely to be identified in areas where vegetation is overgrown. Pest control measures can include ensuring vegetation is kept trimmed and tidy or anywhere that can provide cover for burrowing animals. Examples of burrowing animals can include moles, badgers and rabbits. Badger burrows are commonly found along exposed banks. Mole burrows look like small mound shaped hills and rabbit burrows can be found in grasslands and forests, particularly in areas of long grass and tend to form a series of holes with underground channels. Key areas for wildlife on the site include the planted hedgerows, meadows and



native shrubs. For locations of these areas on site, refer to Drawing 02 for a Landscape Plan. Please refer to Figure 03 for photographs of examples of types of burrows by different animals.

Figure 03 - Photographs of Examples of Animal Burrows





4 Frequency of Monitoring

Table 2 below provides an outline of the frequency of monitoring required to maintain the integrity of the capping layer beneath the site.

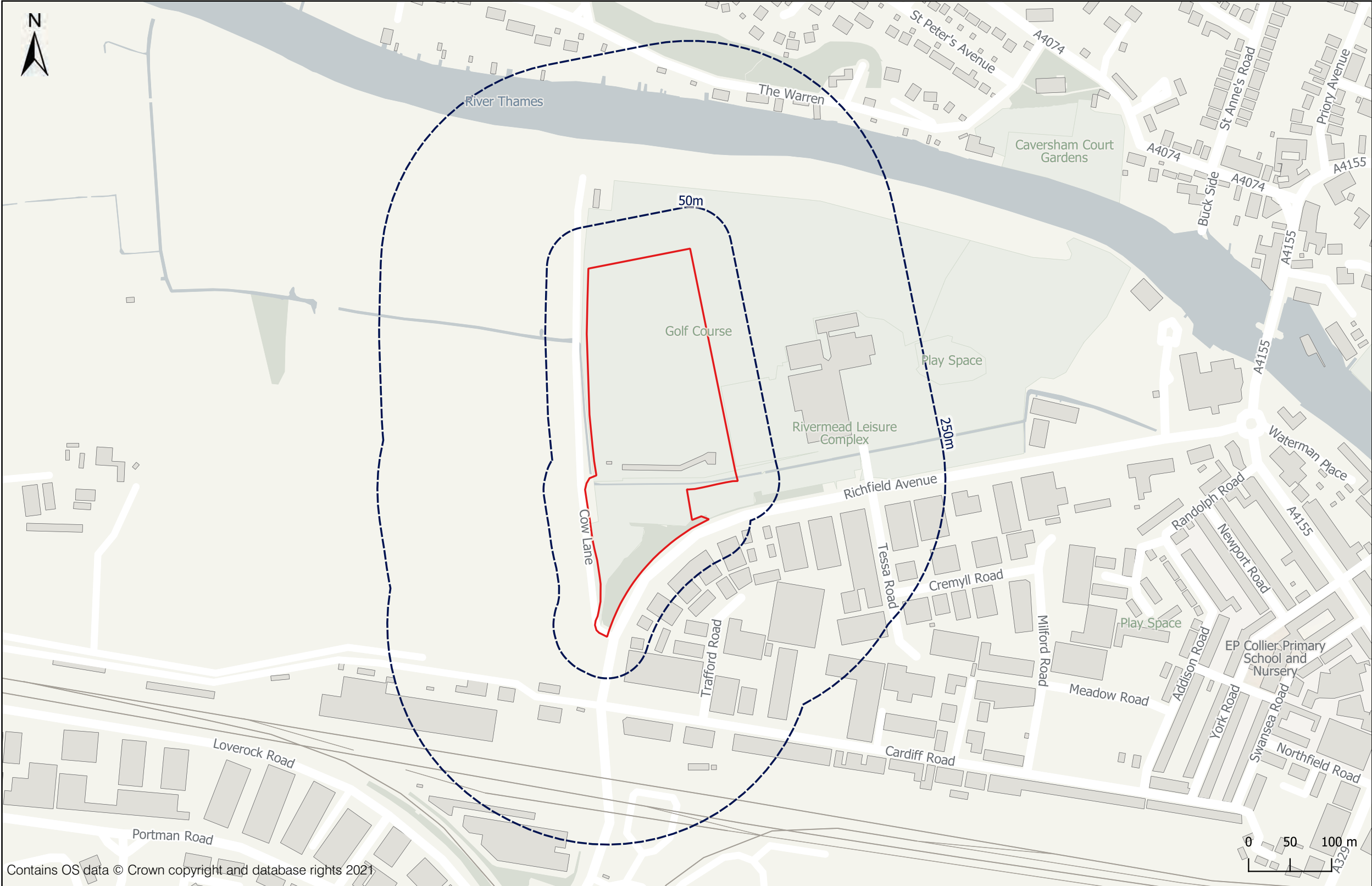
Table 2: Frequency of Maintenance and Monitoring

Long Term Maintenance	Description	Timings	Additional Notes
Burrowing Animals	There is a risk of burrowing animals burrowing into the capping layer, causing disturbance. Routine inspections must take place to identify burrows. A regular site walkover to identify burrows is considered adequate.	Monthly inspections	Monthly inspections or as required if burrows are spotted. Pest control procedures can be implemented which include ensuring vegetation is kept clear and tidy.
Vegetation/Trees	A capping layer of 600mm should provide protection of roots disturbing the capping layer. However, it is Important to monitor collapsed trees as well as overgrown tree roots that could cause disturbance/damage to the capping layer.	Monthly Inspections	On monthly inspections, check for exposed tree roots, or cracks in the ground surrounding the trees. Overgrowth of tree roots could cause damage to the cover layer. Inspections should take place following extreme weather events, i.e. heavy rainfall or strong winds.
Odours	Mitigation measures have been put in place to prevent the release of gases/odours. If odours are detected, inspection of the gas protection measures should be undertaken.	As Required	Any odours identified should be dealt with accordingly as required. For the first 12 months, it is understood, Bowmer and Kirkland will be the primary point of contact. Following this, a school representative will be responsible.
Inspection of soft cover areas	Regular inspection of the soft cover layers should be undertaken to maintain the integrity of the capping layer. A walk over of the site to inspect the ground quality is required.	Monthly Inspections	Monthly inspections or as required if damage is spotted. Identify potential landfill material and if identified, this should be disposed of accordingly. Inspections should take place following extreme weather events, i.e. heavy rainfall or strong winds.
Inspection of ground beams with voids in the event of flooding	The ground beams are in place to allow flooding of this level (300mm allowance). Inspections of these voids should take place to avoid blocking of these voids.	As Required	Inspections should take place post-flooding to ensure the site is safe for re-access. In the event of a flood, the jetting of the voids will be undertaken by an appointed subcontractor to clean and remove blockages.

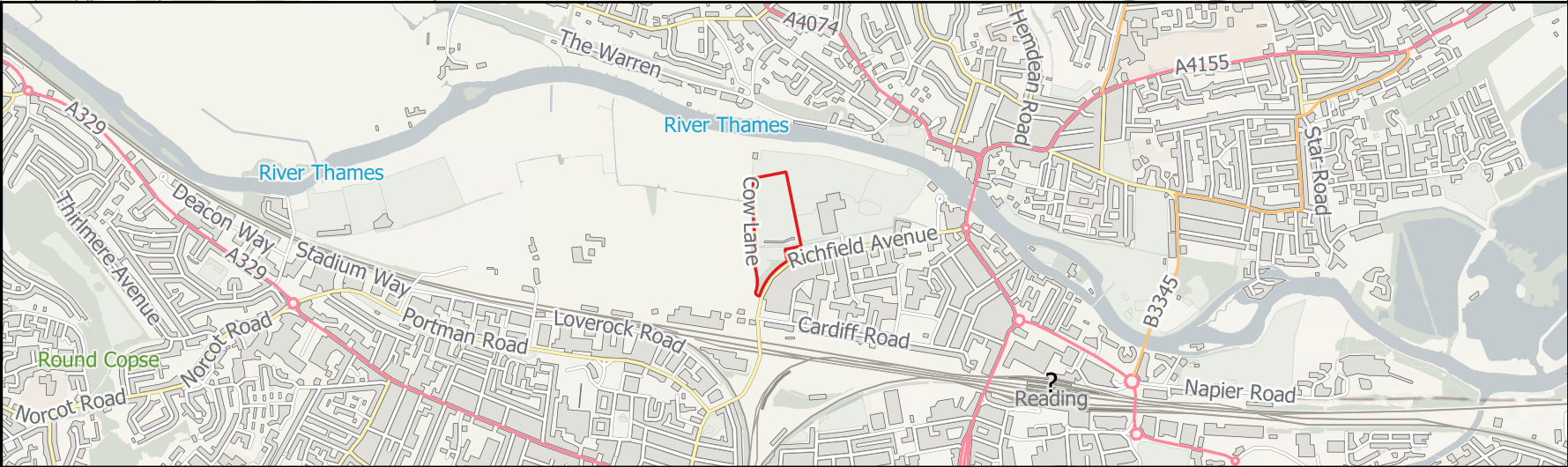


Drawing 01

Site Location



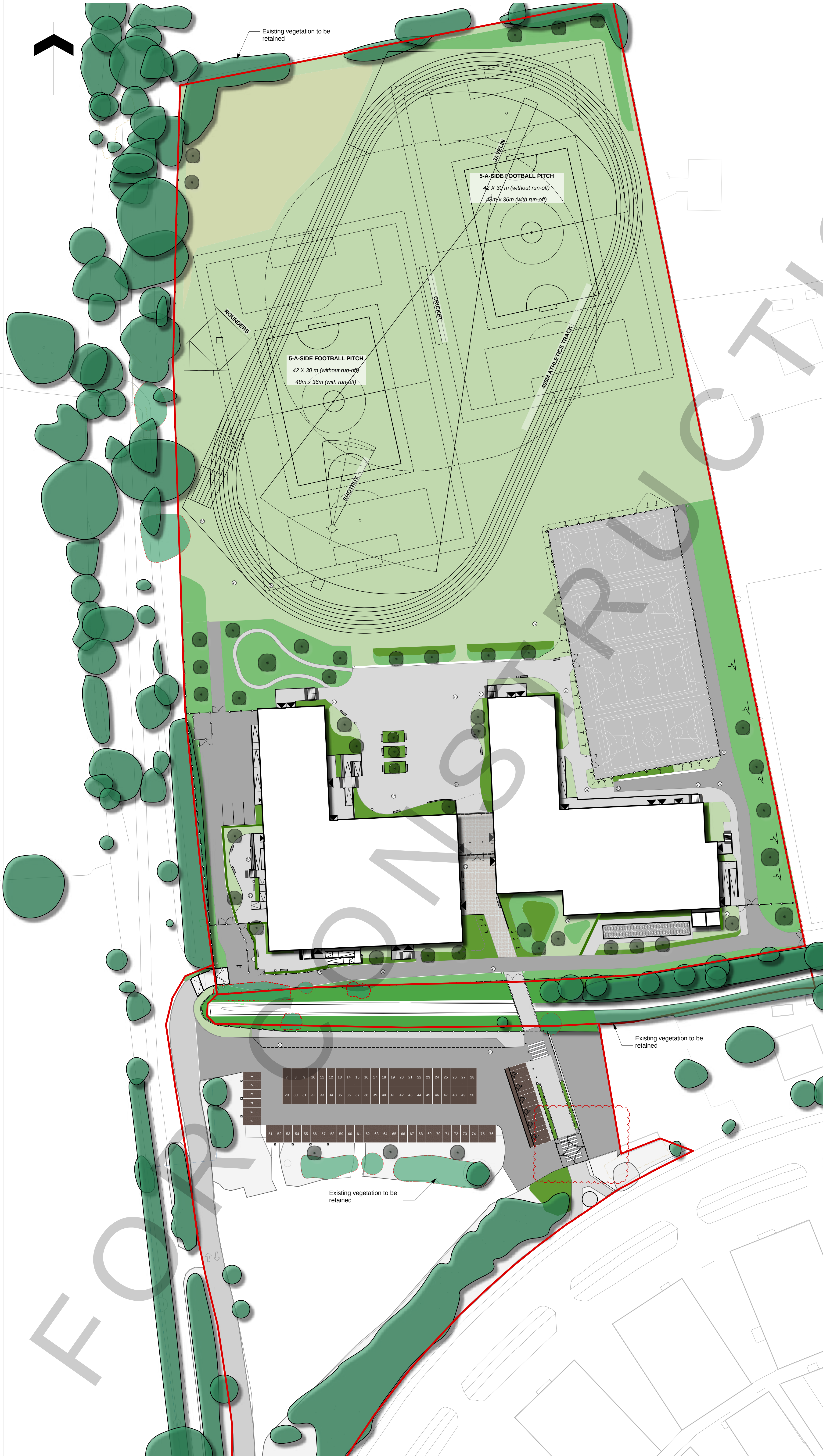
Legend		
Indicative Site Boundary		
Buffer		
Client		
Bowmer and Kirkland		
Project		
River Academy		
Title		
Site Location Plan		
Report No.	Drawing No.	Revision
130321-S03	01	-
Scale	Date	Frame Size
1:5,000	07/03/2022	A3
Produced by	Drawn by	Approved by
LC	LC	CM





Drawing 02

Landscape Plan



KEY

- Application Boundary
- Existing Trees
- Existing Trees To Be Removed
- Existing Vegetation
- Proposed Building
- Ground Floor Cut-Through (First and Second Floor Connection)
- Building Entrance/Exit Point

HARD LANDSCAPE

- PEDESTRIAN TARMAC
- VEHICULAR TARMAC
- PEDESTRIAN BLOCK PAVING
- PERMEABLE BLOCK PAVING
- PERMEABLE TARMAC

SOFT LANDSCAPE

- PROPOSED GRASS SEED
- PROPOSED AMENITY PLANTING
- PROPOSED MEADOW PLANTING
- PROPOSED WILDFLOWER PLANTING
- PROPOSED NATIVE SHRUB PLANTING
- PROPOSED TREE PLANTING
- PROPOSED HEDGE PLANTING

SITE FURNITURE

- CYCLE STAND WITH CANOPY
120 cycle spaces
- STEPS
- HANDRAILS FOR STEPS
- RAMP
- HANDRAILS FOR RAMP

C08	09/04/2024	Gates shifted down in south of car park - tarmac area slightly increased to allow for this.
C07	18/01/2024	1. Updated to latest layout 2. Native shrub planting added to key
C06	22/03/2023	Titleblock updated
REV	DATE	DESCRIPTION

CLIENT



CONTRACTOR



CONSULTANT



PROJECT

River Academy

DRAWING TITLE

Landscape Illustrative Masterplan

DRAWING PURPOSE

A4 - FOR CONSTRUCTION

DRAWN BY	DATE	CHK'D BY	SCALE	MEDIA
MH	10.09.2021	JG	1:500	A1

CONTRACT DRAWING REFERENCE (AS REQUIRED)

PROJECT - ORIGINATOR - ZONE - LEVEL - TYPE - ROLE - NUMBER	REVISION
FS0949-ALA-XX-ZZ-DR-L-0001	C08



Appendix A 12-Month Gas Monitoring Plan



Thank you

for using Ashfield Solutions

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