Ricardo
Energy & Environment

Ecological Enhancement Report

Richmond upon Thames College (RuTC)

Reserved Matters Application – Sports Centre Development

Planning Condition U07943 on Outline Application 15/3038/OUT

ED61703 | Issue Number 2 | Date 30/05/2017

Customer:

Richmond upon Thames College

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Date:

30 May 2017

Ricardo Energy & Environment reference:

Ref: ED61703- Issue Number 2

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1 Introduction

This report has been prepared by the Water & Environment Practice of Ricardo Energy and Environment on behalf of the Richmond upon Thames College (RuTC), for the discharge of planning conditions relating to the outline permission (15/3038/OUT) received on the Richmond Education and Enterprise Campus development (REEC) development and in support of the Reserved Matters submission by RuTC. The report relates to the second phase of construction (the Sports Centre Development) in the College Development Zone. The area of the proposed development within the context of the wider site is shown in **Figure 1**. The first phase of construction (the main College building) was the subject of separate Reserved Matters submission (16/4747/RE).

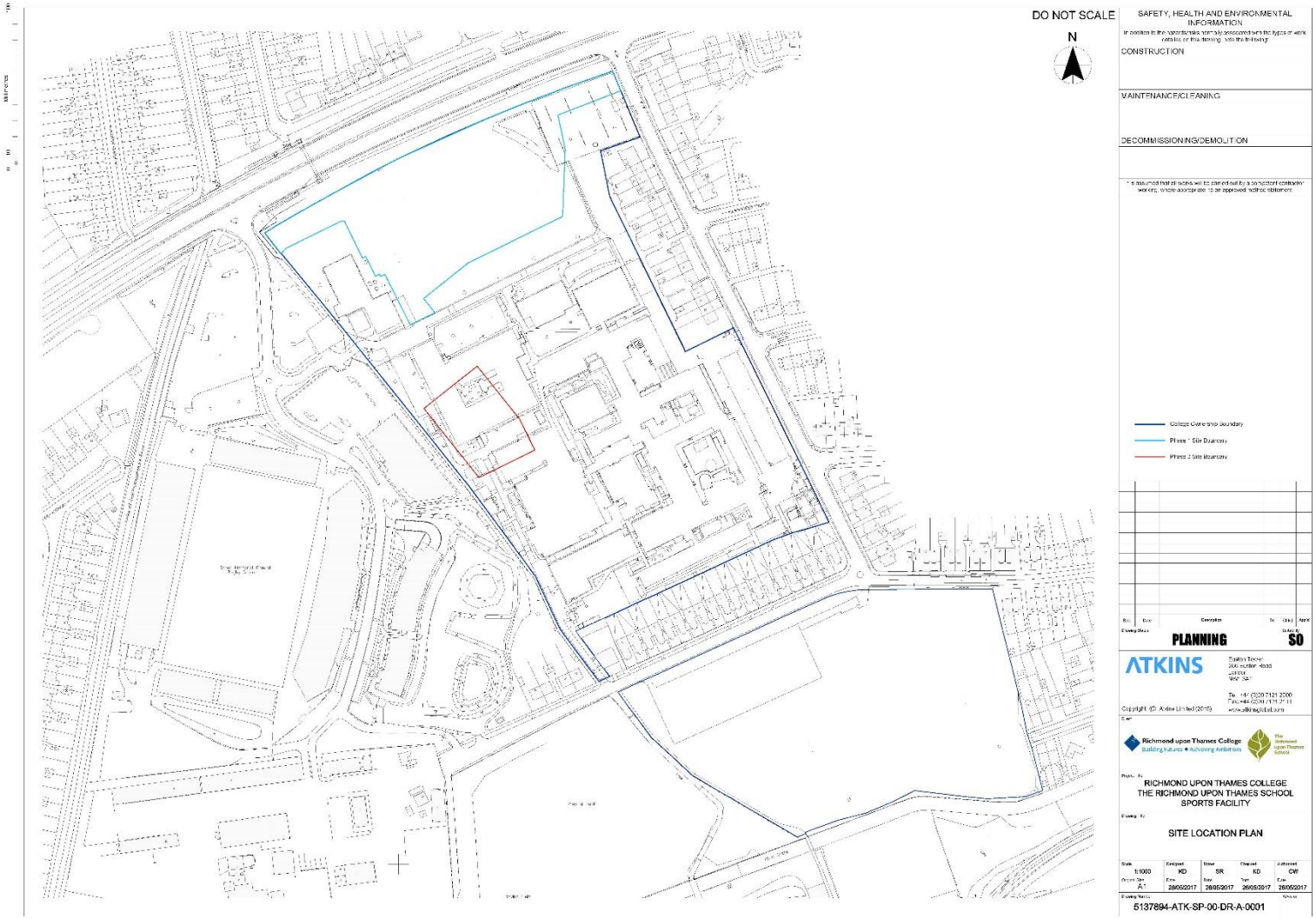
An Ecological Enhancement Report is required to discharge planning condition **U07943 Ecological Enhancement Measures**) which states:

"That as part of development hereby approved bat and bird boxes, stag beetle loggeries, green corridors, brown and green roofs, green fences and other ecological enhancements shall be installed in accordance with details to be submitted to and approved in writing by the Local Planning Authority; such details to show the number, type and location of the boxes. These measures shall be installed prior to the occupation of more than 50 flats in the Residential Development Zone hereby approved.

REASON: To preserve and enhance nature conservation interests in the area."

As the discharging of planning conditions has been split into the various development zones, not all the enhancements listed in the Ecology chapter of the Environmental Statement, and planning condition U07943, are applicable. In particular, the inclusion of stag beetle loggeries and scrub habitats are applicable to the College Playing Fields development zone only. This report details the ecological enhancement measures to be implemented as part of the Phase 2 development (Sports Centre Development) in the College Development Zone only.

Figure 1 Site Location Plan (*Source*: Atkins)



2 Habitat Enhancements

2.1 Trees

The planting schedule for the Phase 2 Sports Centre Development is shown on **Appendix 1** (LUC Drawing 6377-LD-DET-431): This includes provision for two mature trees (liquidamber *Liquidambar styraciflua)* adjacent the southern boundary of the building which will strengthen and complement the future planting as part of the upgrade of Marsh Farm Lane (to be undertaken in a later phase of development).

Further planting within the Phase 2 Sports Centre Development has been constrained due to the space requirements of the Sports building itself and the associated car parks. Planting in future phases of development in the College Development Zone will be designed to further increase connectivity throughout the site.

All tree planting will be undertaken in accordance with BS 5837 'Trees in relation to design, demolition and construction. Recommendations' and BS 8545 'Trees from nursery to independence in the landscape. Recommendations'. Details of the tree pit design, including root barrier, guying system and aeration and irrigation pipes are found in **Appendix 2** (LUC Drawing 6377-LD-DET-634). Further details on the planting methodology are found in **Appendix 1**.

2.2 Groundcover and Climbers

There will also be three areas of ground cover planting in the carpark area (see **Appendix 1**). Species to be used include bugle *Ajuga reptans*, common fern *Dryopteris filix-mas*, spindle *Euonymus fortunei*,

A further area of planting, along the boundary with the residential development, will be made with spindle (*Euonymus fortunei*) (see **Appendix 1**).

2.3 Green Roof

The Development Management Plan (2011) for London Borough Richmond-upon-Thames refers to green roofs under Policy DM SD 4 (Adapting to Higher Temperatures and Need for Cooling) and DM SD 5 (Living Roofs) DM OS 5 (Biodiversity and New Development). Policy DM SD 5 recommends that green roofs are incorporated into new developments where technically feasible and subject to considerations of visual impact, aiming to provide at least 70% coverage.

The feasibility of including a green roof on the Sports Centre building has been investigated and it is considered to be possible to include green roof modules on the area of roof not taken up by essential plant equipment. 'Plant' includes; ventilation, vents, roof lights, roof access hatch with additional space required for maintenance of these structures. The area of green roof proposed for the Sports building is 504m^2 which represents 39.5% of total useable roof space (1,277m^2) (see **Appendix 3**).

This area has been constrained by the space dedicated to housing solar photovoltaic panels. This area has not been excluded from the calculations of percentage area of green roof. The proposed photovoltaic panels are an important aspect of the development sustainability strategy. The height of the photovoltaic panels means that it is not possible to install green roof underneath the panels. The area available for green roof coverage is further constrained by health and safety considerations.

The green roof will be created using Bauder's XF301 Sedum Blanket, a sedum blanket system which consists of a mixture of up to 11 species of sedum together with mosses and grasses (see **Appendix 4**). The species mix includes: *Sedum acre, Sedum album* - 'bella d' Inverno*, Sedum album* - coral carpet*, Sedum ewersie, Sedum Kamtschaticum* – ellacombianum*, Sedum Kamtschaticum* - weinstephaner gold*, Sedum montanum orientale, Sedum pulchellum, Sedum rupestri (reflexum), Sedum sexangulare, Sedum spurium - mesemlanthemum = Delosferma, Sedum spurium - mesemlanthemum = hallii, and Sedum verticillatam*.

The green roof will provide additional a biodiversity benefits by creating suitable habitats for invertebrates and bird species which utilise brownfield sites.

Plate 1: Bauder Xero Flor XF301 Vegetation Blanket

Green roofs are low maintenance but are not maintenance free. As a result, the following maintenance activities will be carried out annually during the spring and autumn of the first year and annually thereafter:

- Removal of debris and leaves from the roof surface, rainwater outlets, chutes, gutters, etc. All debris should be removed from the roof and not flushed down rainwater pipes.
- Replace areas of settled substrate.
- Replace failed plants with sedum cuttings.
- Hand weeding of the roof to removal any undesirable plants. At least every five years the vegetation / top layer of substrate should be disturbed by hand using a rake, to maintain the desired habitat and prevent succession to a more stable habitat type.
- Fertiliser application.

All inspections / maintenance activities will be recorded on a roof plan, marked with co-ordinates of the location of specific issues, to provide an ongoing record of the inspection which can be compared year on year.

3 Species Enhancements

The loss of semi-natural habitat across the wider REEC site will result in a loss of feeding and nesting opportunities for bats and breeding birds. To mitigate the loss of these opportunities, 15 bird boxes and six bat boxes will be installed across the site. The School Development Zone will provide nine bird nest sites and two bat boxes. The College Phase 1 Development in the College Development Zone, the subject of separate Reserved Matters submission (16/4747/RE), incorporates three bird boxes and one bat box.

The provision discussed below relates to the Phase 2 Sports Centre Development in the College Development Zone only.

Additional provision will be made both in the remaining phases of development in the College Development Zone, and also in the development in the Tech Hub and Residential Development Zones. Details of species enhancements for the rest of the College site will be provided within the Reserved Matters and Discharge of Conditions submissions for the relevant development zone or phase.

3.1 Bat Boxes

A Schwegler 1FF bat box will be installed on the north western corner of the Sports Building, facing the Marsh Farm Lane corridor. Information obtained from the bat surveys carried out to support the outline application[1] suggests that the majority of bat activity is associated with the River Crane and Duke of Northumberland's River, around the grassland habitats to the north and south of the college, alongside Challenge Court and along peripheral habitats. Common pipistrelle *Pipistrellus pipistrellus* and soprano pipistrelle *Pipistrellus pygmaeus* were the dominant species recorded, with serotine *Eptesicus serotinus* and *Nyctalus* sp. recorded in low numbers. The upgrade of the Marsh Farm Lane corridor in a future phase of development in the College Development Zone will enhance the habitat and foraging opportunities for bat species. The bat box on the Sports Building is located complement this enhancement.

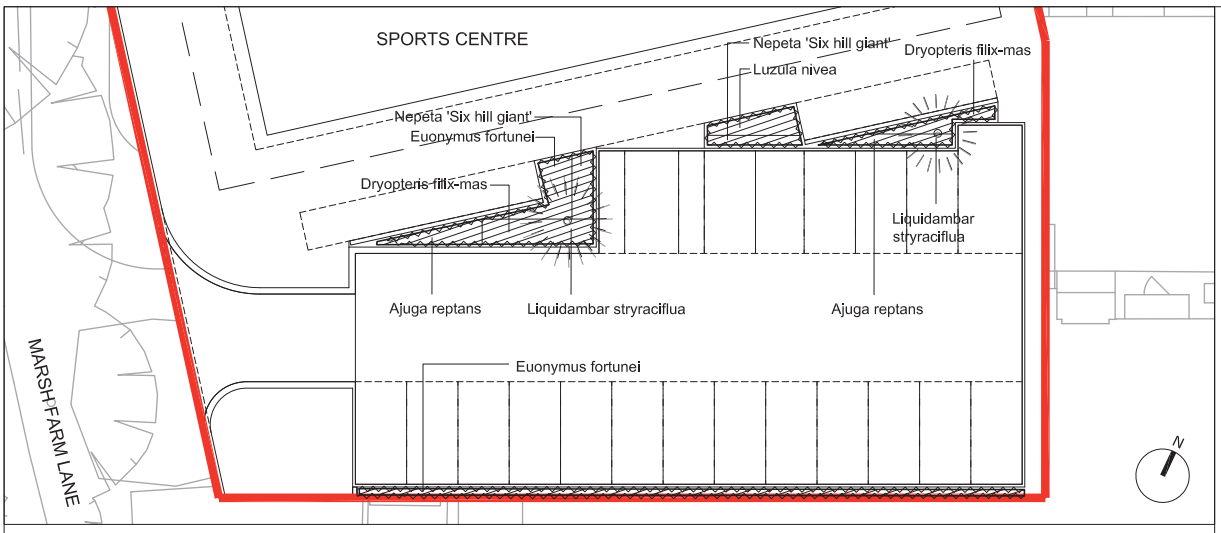
The bat box will be installed in an area of open roof containing external plant, at a height of 12.6m above floor level. The proposed location for the bat box is annotated on *General Arrangement Floor Plan Roof Level* **Appendix 5**. The box will be mounted in the building staircase's west facade on level 03, facing Marsh Farm Lane (see *Bat Box Location* in **Appendix 5**).

3.2 Bird Boxes

No bird boxes are proposed for the Phase 2 Sports Centre Development as the available habitat is limited. However, the site sits adjacent the Marsh Farm Lane which provides more favourable habitat and provision for bird boxes will be made in this and other later phase of development (e.g.in the College Playing Fields Development Zone).

[1] Cascade Consulting (2015) Richmond Education and Enterprise Campus Development: Environmental Statement, Chapter 15 Ecology, Appendix 15.2 Breeding Birds and Bats Species Report. Report prepared by Cascade Consulting for London Borough of Richmond Upon Thames

Appendix 1 – LUC Drawing-LD-PLN-431 Soft Landscape



Legend:

- **Sports Centre Boundary**
- **Proposed trees** Refer to LUC tree pit detail 6377_LD_DET_634
- **Proposed groundcover** Geotextile fabric and bark mulch

SCHEDULE

	Type / Species	Specification	Density/Percentage
	Trees		
2	Liquidambar stryraciflua	12-14 cm girth, height 300-400cm, RB	As shown
	Groundcover		
35	Ajuga reptans	2l pot	6/m2
43	Dryopteris filix-mas	2l pot	5/m^2
23	Euonimus fortunei	5l pot	8/m^2
90	Hedera cholchica	1L pot	10/m2
23	Luzula sylvatica	2l pot	8/m2
30	Nepeta 'Six hill giant'	2l pot	8/m2

OUTLINE SPECIFICATION NOTES

GENERAL
All supply, planting and other landscape works to be in accordance with relevant British Standards and Codes of Practice. Works to be undertaken by a competent and accredited landscape contractor with 12months Defects Liability/ in contract maintenance. Following that maintenance works shall be undertaken in accordance with the Landscape Management Plan, LUC 2016.

PLANTING METHODOLOGY
Soil
Soil to be free of pests, disease, fungus and foreign matter.
Do not use topsoil contaminated with subsoil, rubbish or other materials that are corrosive, explosive, flammable, hazardous to human or animal life or detrimental to healthy plant growth.
The Contractor shall appoint a suitably qualified and approved, independent Soil Scientist to undertake the sampling and testing of the soil materials considered for importation.
An approved Soil Scientist is: Tim O'Hare Associates LLP, Howbery Park, Wallingford, Oxon, OX10 8BA, Tel: 01491 822653, www.toha.co.uk
Subsoil to be in accordance with BS 3882 'Specification for topsoil'.
For trees planted in hard landscape a load bearing growing medium will be necessary. This will be Urban tree planting medium, Grade: 0.6-2 mm.
Green compost for soil amelioration to be incorporated into soil for tree and shrub planting to be in accordance with BSI PAS 100:2011 or current revision and sourced from a PAS 100 compliant facility.
Fertilizer to be incorporated into soil for tree and shrub planting: Scotts Enmag CRF (11%N:22%P2O5:9%K2O:6%MgO).
Prepare undisturbed topsoil in accordance with BS 4428 'Code of Practice for general landscape operations': Break up hard ground thoroughly, remove visible roots and large stones with a diameter greater than 50 mm, dig areas covered with turf over to full depth of topsoil and treat weeds at appropriate times with a suitable translocated non-residual herbicide.
Prepare subsoil by excavating/placing fill to the required profiles, loosening thoroughly when ground conditions are reasonably dry to a depth of 450mm and removing stones larger than 50mm, arisings, contaminants, debris and builders' rubble.
Spread topsoil in layers of layers of 150 mm maximum depth and gently firm each layer before spreading the next.
After spreading topsoil, when weather and ground conditions are suitably dry and non-plastic, the soil profile shall be ripped at 300mm centres to a minimum depth of 300mm (grass areas) or 600mm (shrub beds, hedges) to decompact the soils and key in the topsoil and subsoil layers. Any large, compacted lumps of soil shall be broken down by further appropriate cultivation (in accordance with BS 4428) to produce a fine tilth suitable for planting (<30mm), turfing and seeding (<10mm). Cultivations shall ensure that the topsoil is fully aerated.
In order to avoid physical degradation to the soil during all phases of soil handling (e.g. spreading, cultivation, amelioration, planting, turfing and seeding), soil handling operations shall be carried out when soil is non-plastic (friable) in consistency (i.e. at least 5% below the soil's lower plastic limit). Soil shall not be unnecessarily compacted by trampling or trafficking by site machinery or handled when frozen or during and after heavy rainfall.

Timing
- Deciduous trees and shrubs: Late October to late March. Field-grown trees and shrubs planted out of season to be spring-ringed at nursery.
- Conifers and evergreens: September/ October or April/ May.
- Herbaceous plants: September/ October or March/ April.
- Container grown plants: At any time if ground and weather conditions are favourable. Provide watering and weed control as necessary.
- Dried bulbs, corms and tubers: September/ October.

Standard
All planting to be carried out in accordance with BS 4428 and during suitable weather conditions. Do not use mechanical tools within 100 mm of tree and plant stems. Water as necessary to ensure establishment and continued thriving of planting.
Plants to be materially undamaged, sturdy, healthy and vigorous specimen, of good shape and without elongated shoots, grown in a suitable environment and hardened off and free from pests, diseases, discoloration, weeds and physiological disorders. Plant standard to
BS 3936 'Nursery stock'. Name, forms, dimensions, provenance and other criteria as scheduled and defined in the National Plant Specification. Plant handling shall be in accordance with HTA 'Handling and establishing landscape plants'.

Groundcover
Geotextile fabric to all beds to be laid before planting. Cut flaps neatly for planting and refit closely around plant stems. Mulch with Melcourt Mini Pine Mulch, 60mm depth. Finished level of mulch to be 30 mm below adjacent grassed or paved areas.

Climbers and ornamental shrubs
Planting bed depth to be 450mm minimum. Geotextile fabric to all hedges beds to be laid before planting. Cut flaps neatly for planting and refit closely around plant stems. Mulch with Melcourt Mini Pine Mulch, 60mm depth. Finished level of mulch to be 30 mm below adjacent grassed area. Shrubs to be grouped by 3 to form irregular 'natural' layout.

Trees
All tree planting to be undertaken in accordance with BS 5837 'Trees in relation to design, demolition and construction. Recommendations' and BS 8545 'Trees from nursery to independence in the landscape. Recommendations'.
For detail of tree pit including root barrier, guying system and aeration and irrigation pipe refer to LUC drawing 6377-LD-DET-634. Semimature trees to be root prepared and transplanted to BS 4043 'Recommendations for transplanting root-balled trees'.
All standard trees to be secured with 2 no. stake. Stakes to be 50mm diameter softwood, peeled chestnut, larch or oak, straight, free from projections and large or edge knots and with pointed lower end with nails to BS 1202.
Backfill with ameliorant (1 m^3 per 10 m^3 of topsoil) and fertiliser as specified.
Mulch with Melcourt Mini Pine mulch. Finished level of mulch to be 70 mm below adjacent grassed or paved areas.

MAINTENANCE
For general soft landscape maintenance - including native hedge, hedges, groundcover, climbers and lawn - refer to LUC Landscape Management Plan.

Trees
Newly planted trees across the site will need to be watered regularly by hand during
establishment i.e. for 3 years after planting.
Soil around the base of trees in grass will be kept clear of weeds.
Stakes/ties/ guys will be inspected and maintained in good order, adjusted and repaired where necessary to prevent rubbing of bark and removed when no longer required.
Trees will be visually inspected on routine maintenance visits for damage and general safety and security issues. Damaged branches will be removed from both tree and ground promptly to minimise damage to the tree and danger/obstruction to users of the site.
For newly planted trees formative pruning work will be carried out as required and as appropriate for the species to remove branches overhanging or obstructing access and to maintain the form and health of the tree. All pruning to be carried out by a Member of the Arboricultural Association and in accordance with BS 7370 'Grounds maintenance. Recommendations for maintenance of soft landscape'.

Notes:

1. Do not scale from this drawing.
2. All dimensions must be checked on site and any discrepancies verified with landscape architect.
3. All dimensions are drawn in mm.
4. Landscape drawing only.
5. All materials/items used to be as specified or alternatives to be approved by landscape architect.

A	16.05.17	First Issue		NL	EP
Iss	Date	Issue Notes		Ch	Ap

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Project
Richmond Upon Thames College
Sports Centre

Client
Atkins

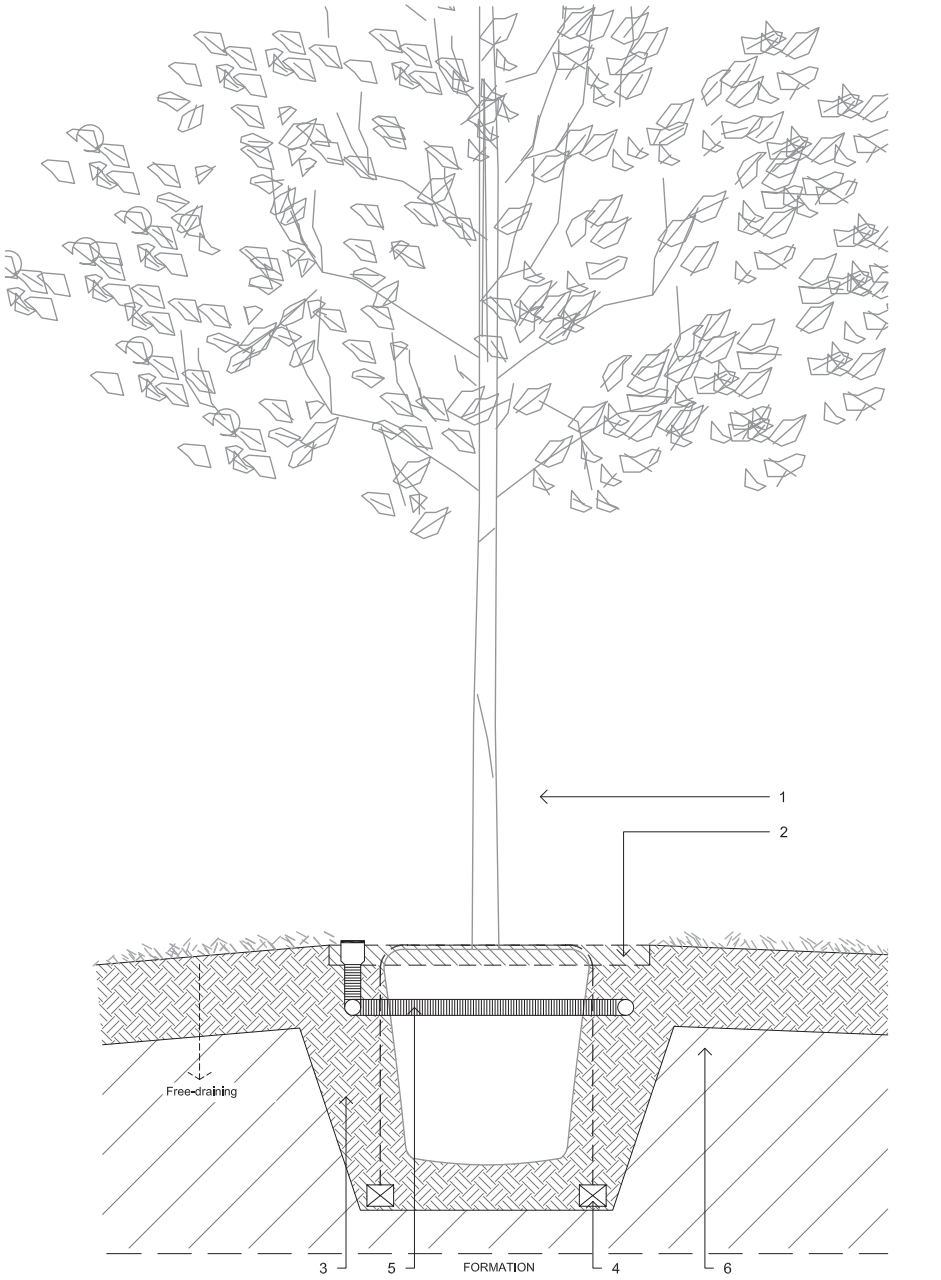
Title
Soft Landscape

Scale	Status
1:250 @ A3	for Planning

Job No.	Drawing No.	Issue
6377	LD PLN 431	A

Appendix 2 – LUC Drawing 6377-LD-DET-634 - Tree Pit Detail

NOT FOR CONSTRUCTION



A Tree In planting
1:20 @ A3

Notes

- Do not scale from this drawing, use only written dimensions.
- All dimensions are drawn in mm unless otherwise noted.
- All dimensions must be checked on site and any discrepancies verified with landscape architect.
- Landscape drawing only - to be read In conjunction with architect and engineers drawings.
- All materials/Items used to be as specified or alternatives to be approved by landscape architect.

1. For detailed tree specification see LUC drawing 6377 LD PLN 431.
2. Melcourt 'mini mulch' pine mulch. Finished level of mulch to be 70mm below adjacent lawn.
3. Imported topsoil to Q28.
4. Rootball guying kit: Platypus RF2RDMP or similar, to Installation manual.
5. Mona Link irrigation system by green-tech using 4nr mona link 24 tanks joined with unperforated jointing pipe, complete with airpipe, level indicator and vent cap.
6. 350mm ripped subgrade

- All tree planting to be undertaken In accordance with BS5387:2012 Trees in Relation to Design, Demolition and Construction' and BS8545 'Trees from nursery to independance in the landscape'.
- All semi-mature trees to be root prepared and transplanted to BS4043 'Recommendations for transplanting root-balled trees'.
- All standard trees to be secured with 2nr. stakes of 50mm dia softwood, peeled chestnut, larch or oak, straight and free from projections and large or edge knots and with pointed lower end with nails to BS1202.
- Backfill with ameliorant (1m3 per 10m3 topsoil) and fertilizer as Q28.
- Refer to LUC drawing 6377 LD PLN 431 and to the outline landscape management plan for further details.

Iss	Date	Issue Notes	Drn	Chk	Apv
A	15.03.17	Plan Issue	ML	EP	EP

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Project
Richmond Upon Thames College
Sports Centre

Client
Atkins

Title
Tree Pit Detail

Scale	Status
1:20@A3	for Planning

Job No.	Drawing No.	Issue
6377	LD DET 634	A

Appendix 3 – Atkins Drawing 5137894-ATK-SP-00-DR-A-1003-General Arrangement Floor Plan Roof Level

DO NOT SCALE

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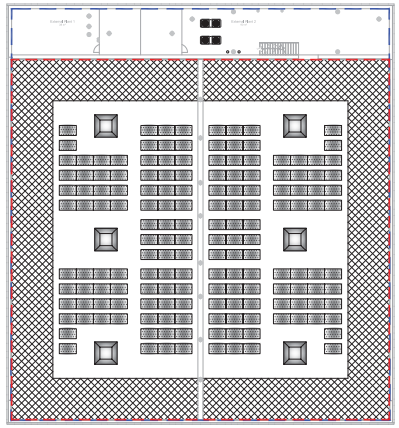
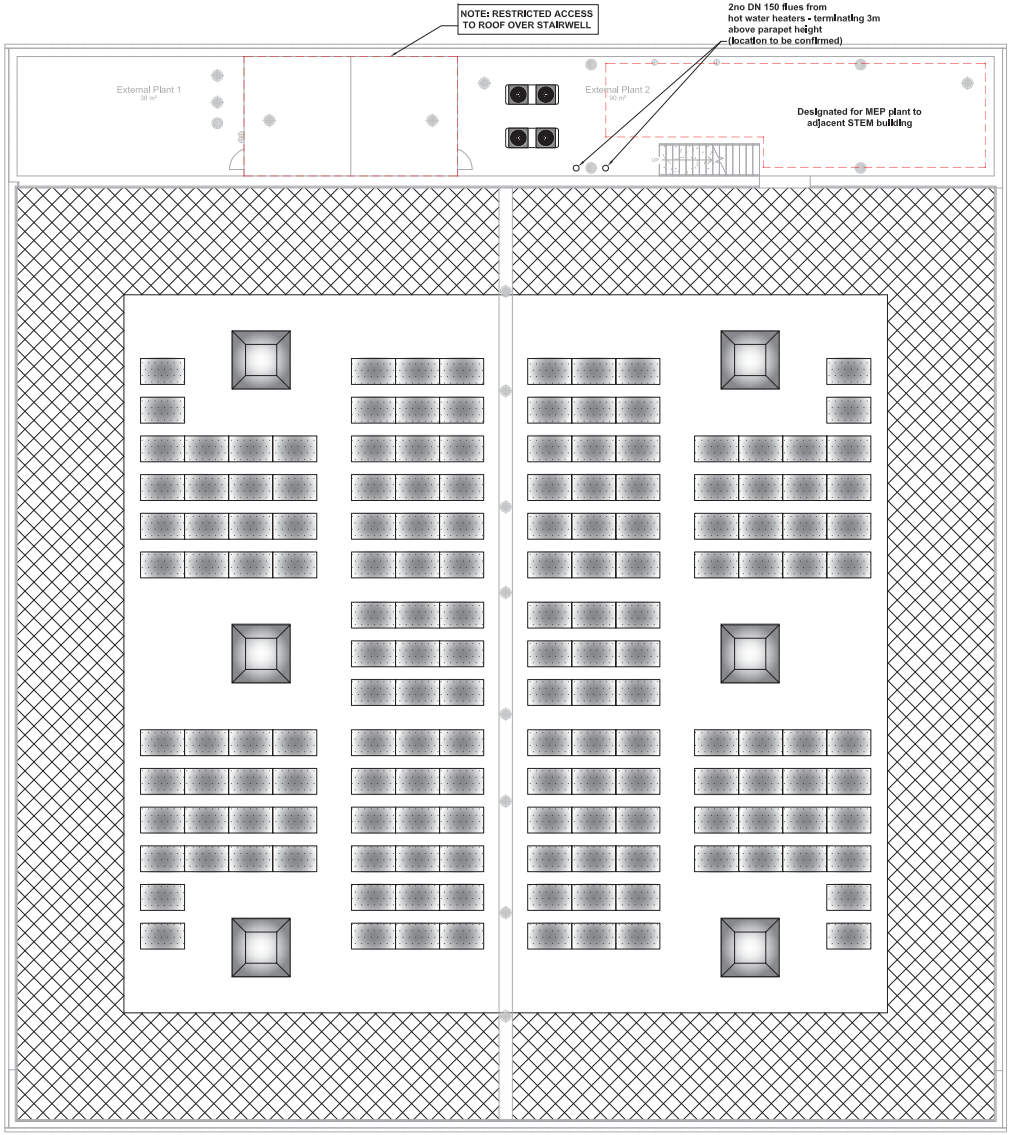


Overall Roof Area - 1,405 m2

Roof Area (within parapet) - 1,277 m2



1 **GA - ROOF LEVEL**
SCALE 1 : 100

SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION

In addition to the hazards/risks normally associated with the types of work detailed on this drawing, note the following:

CONSTRUCTION

MAINTENANCE/CLEANING

DECOMMISSIONING/DEMOLITION

It is assumed that all works will be carried out by a competent contractor working, where appropriate, to an approved method statement

Legend:

- Roof cowl to Sports Hall ventilation unit (2069 x 2069 x 875mm)
- Solar photo-voltaic panel with fixed tilt of 12° off horizontal (1650 x 991 x 325mm to top of panel)
- Heat pump (1978 x 759 x 1710mm)
- Green Roof - 504 m2 (39.5% of Roof area within parapet)
- Rain water outlets

Rev.	Date	Description	By	Chk'd	App'd

Drawing Status: **PLANNING**

Suitability

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Client: Richmond upon Thames College – Building Futures ✦ Achieving Ambitions; The Richmond upon Thames School

Project Title:
RICHMOND UPON THAMES COLLEGE
THE RICHMOND UPON THAMES SCHOOL
SPORTS FACILITY

Drawing Title:
GENERAL ARRANGEMENT
FLOOR PLAN
ROOF LEVEL

Scale	Designed	Drawn	Checked	Authorised
1 : 100	RD	SR	RD	SM
Original Size	Date	Date	Date	Date
A1	26/05/2017	26/05/2017	26/05/2017	26/05/2017

Drawing Number: 5137894-ATK-SP-00-DR-A-1003

Revision

Appendix 4 – Bauder XF301 Sedum Blanket Technical System Summary

BAUDER

TECHNICAL
SYSTEM SUMMARY

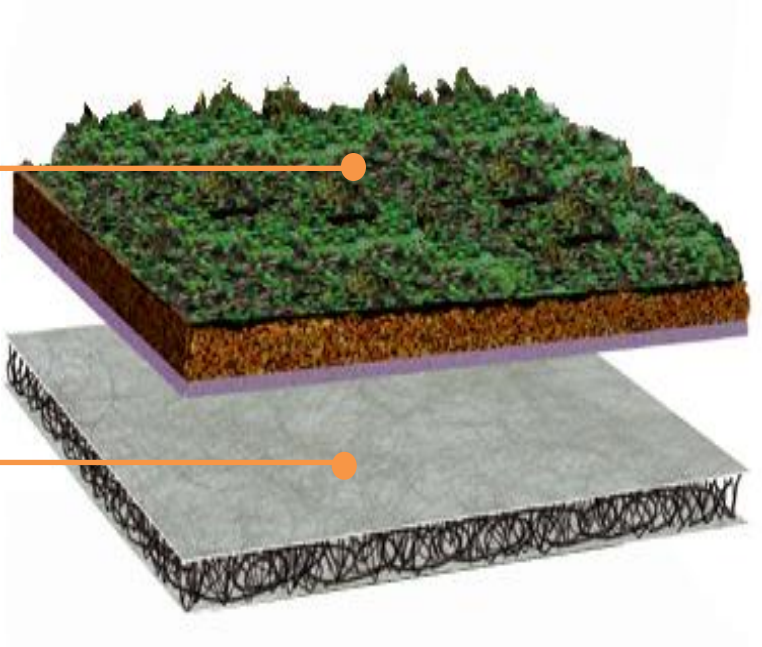
XF301 SEDUM BLANKET

EXTENSIVE GREEN ROOF SOLUTION

A pre-cultivated vegetation blanket on a patented nylon loop and geo-textile base carrier with substrate growing medium. The pre-attached moisture retention fleece provides water storage. The blankets are lightweight, easy to maintain and provide instant greening to the roof. The blanket features up to 11 species of sedum together with mosses and grasses, ensuring plant diversity.

Bauder XF301 Sedum Blanket
is a pre-cultivated vegetation blanket on a patented nylon loop and geo-textile base carrier with special substrate and a pre-attached integral 8mm moisture retention fleece.

Bauder SDF Mat
is a multifunctional drainage, filtration and protection layer manufactured from ultraviolet resistant nylon woven loops which are thermally bonded to geo-textile filter fleece facings.



When to Specify

The Xero Flor sedum blanket is a versatile, exceptionally lightweight green roof system that is suitable for both new build and refurbishment projects. It should be noted that extensive green roof systems are not intended for general access or leisure purposes and are primarily used for their ecological benefits or aesthetic appearance.

Waterproofing Options

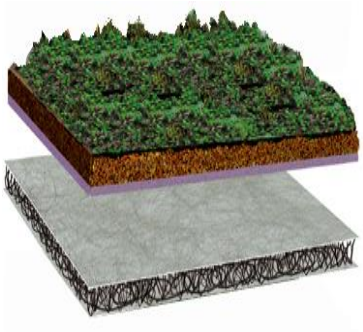
There are different waterproofing systems available to suit the individual project criteria for the green roof, its landscaping options, weight loading limits, performance and durability requirements. Please contact us so that a technical advisor can take you through the system best suited to your project.

TECHNICAL SYSTEM SUMMARY

XF301 SEDUM BLANKET

Weight Loading

Based on 1-2° pitch



Product	Thickness (mm)	Saturated Weight (Kg/m²)
Bauder XF301 Sedum Blanket	28.0	44.0
Bauder SDF Mat	20.0	0.2
Totals	**48.0**	**44.2**

Appendix 5 – Atkins Drawings 5137894-ATK-SP-00-DR-A-1003-General Arrangement Floor Plan Roof Level *[annotated with location of bat box]* and 5137894-ATK-SP-XX-SK-A-0020 Bat Box Location

DO NOT SCALE

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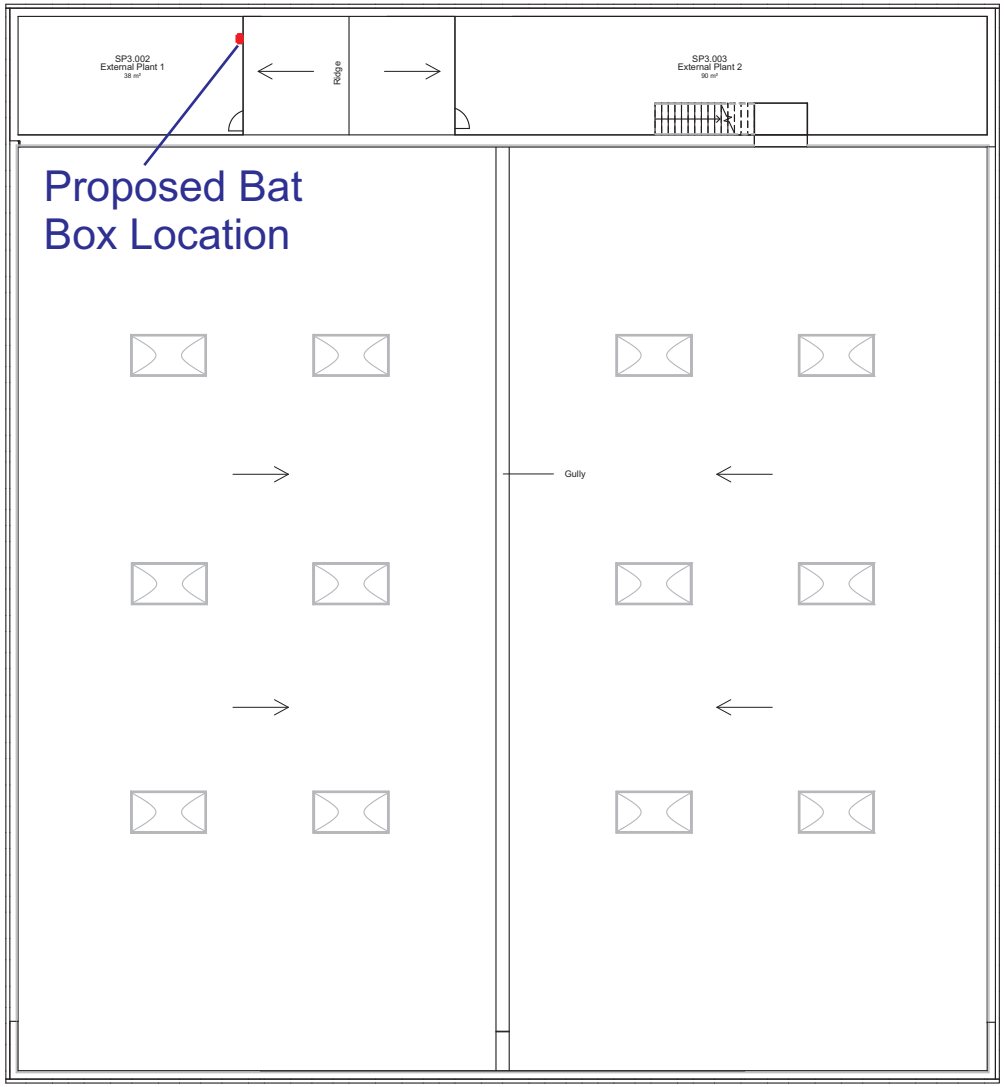

1 **GA - LEVEL RF**
1 : 100

1 0 1 2 3 4 5
SCALE 1:100 m

SAFETY, HEALTH AN D ENVIRONMENTAL INFORMATION

In addition to the hazards/risks normally associated with the types of work detailed on this drawing, note the following:

CONSTRUCTION

MAINTENANCE/CLEANING

DECOMMISSIONING/DEMOLITION

It is assumed that all works will be carried out by a competent contractor working, where appropriate, to an approved method statement

Rev.	Date	Description	By	Ch'kd	App'd

Drawing Status: **PLANNING** Suitability: **S0**

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Client: Richmond upon Thames College – Building Futures ◆ Achieving Ambitions; The Richmond upon Thames School

Project Title:
RICHMOND UPON THAMES COLLEGE
THE RICHMOND UPON THAMES SCHOOL
SPORTS FACILITY

Drawing Title:
GENERAL ARRANGEMENT
FLOOR PLAN
ROOF LEVEL

Scale	Designed	Drawn	Checked	Authorised
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Original Size	**Date**	**Date**	**Date**	**Date**
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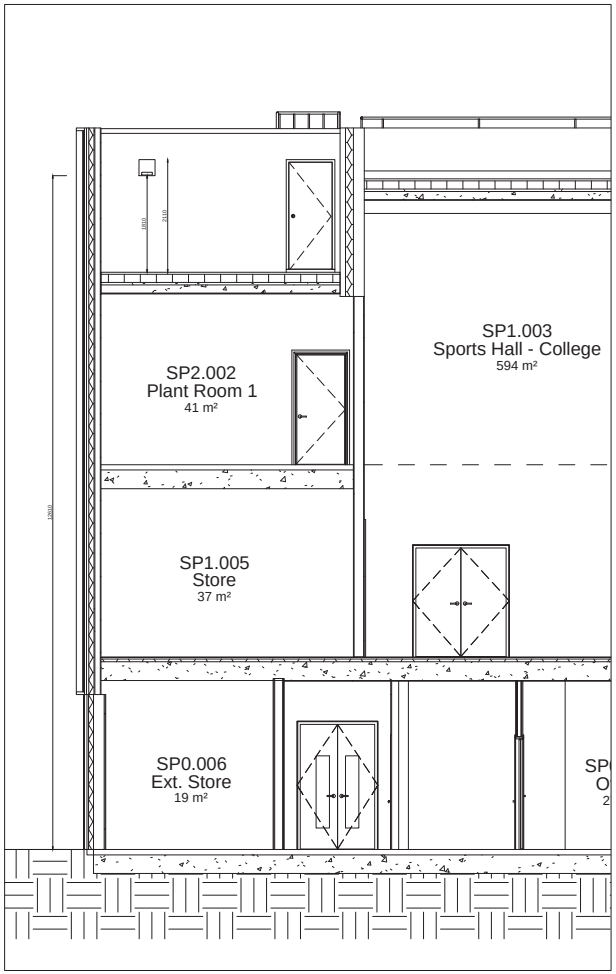
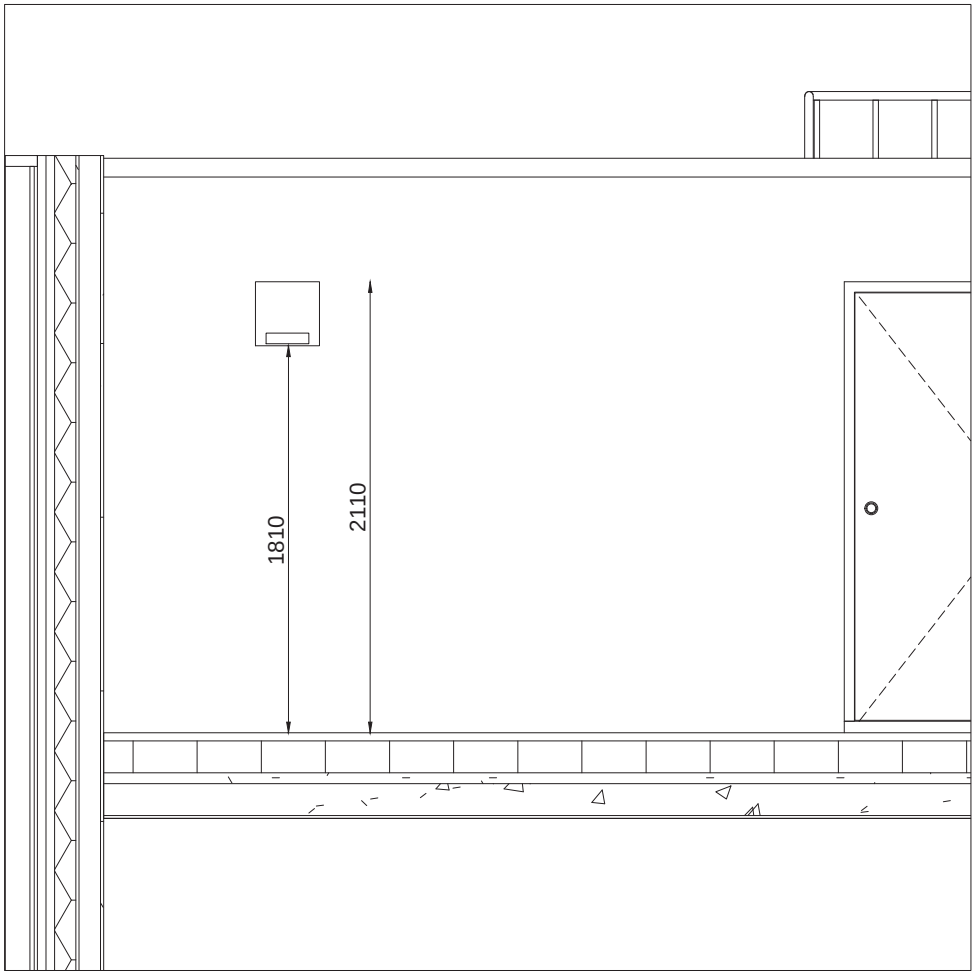
Drawing Number: 5137894-ATK-SP-04-DR-A-1003
Revision:

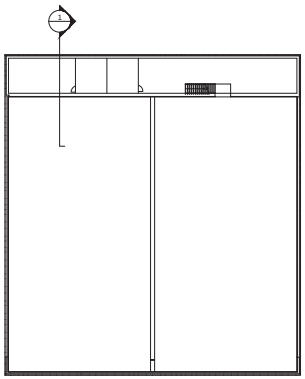
DO NOT SCALE



01 - Bat Box Location 1:100



02 - Bat Box Location 1:25



SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION

In addition to the hazards/risks normally associated with the types of work detailed on this drawing, note the following:

CONSTRUCTION

MAINTENANCE/CLEANING

DECOMMISSIONING/DEMOLITION

It is assumed that all works will be carried out by a competent contractor working, where appropriate, to an approved method statement

Drawing Status: FOR INFORMATION
Suitability: S0

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Client: Richmond upon Thames College – Building Futures ♦ Achieving Ambitions; The Richmond upon Thames School

Project Title: RICHMOND UPON THAMES COLLEGE
THE RICHMOND UPON THAMES SCHOOL
SPORTS FACILITY

Drawing Title: Bat Box Location

Scale	Designed	Drawn	Checked	Authorised
-	SR	SR	KD	CW
Original Size	Date	Date	Date	Date
A3	24/05/2017	24/05/2017	26/05/2017	24/05/2017

Drawing Number: 5137894-ATK-SP-XX-SK-A-0020
Revision:

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