UWE Estates and Facilities Design Guide

Chapter 9: Landscaping, Biodiversity & Infrastructure

UWE Bristol | University of the West of England

SOUTH WEST BUILT ENVIRONMENT AWARDS 2017
CLIENT OF THE YEAR
WINNER

Green Gown Awards International
Winner

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9.1 Change Control

Version Number	Date of Issue	Chapter Ref	Brief Description of Change(s)
1.4	01/05/19		Various updates as detailed in 2019 version
1.5	NOV2019	9.3.2 & 9.4	Various updates as detailed in 2019 version
2021	JAN2021	9.2	References to UWE Sustainability commitments updated.
2021	JAN2021	9.2.1	Standards section completely replaces KPI section.
2021	JAN2021	9.2.2	Various amendments throughout.
2021	JAN2021	9.3	Various amendments throughout.
2021	JAN2021	9.7	Various amendments throughout.

9.2 Scope

The purpose of this Chapter is to inform designers (internal and external to UWE) of UWE's approach to Landscaping and Biodiversity, taking into account;

- The requirements of UWE's Environment management system (ISO14001:2015);
- UWE's sustainability commitments https://www.uwe.ac.uk/about/values-vision-strategy/sustainability/strategy-leadership-and-plans
- Landscape & Biodiversity Action Plan, available by contacting the UWE Grounds Manager

and;

- The need for climate change adaptation as a forethought.

The UWE sustainability team has responsibility for: sustainability; biodiversity, landscaping and tree planting; waste and recycling facilities.

This team is a key stakeholder in the design and planning of any project which alters or impacts on external spaces and should be consulted from RIBA stage 2.

The need for Climate Change adaptation is becoming a pressing issue. Effective design will increase UWE's resilience for coping with resource security (such as fresh water and fuel) and the impact of changing, and more severe, weather events.

As UWE is adhering to requirements of the ISO14001:2015, project teams must adopt sustainable procurement practices and evaluate the life cycle costs of a project (discussed elsewhere in the design guide). Sustainability measures contribute to life cycle savings.

Early consideration should be given to the possibility of creating external teaching or event spaces. There is an emphasis on the unification of the street furniture with the hard/soft landscaping, harmonising the built environment and natural environment. This also contributes to a 'UWE Bristol' feel and recognition of the Campus Environment.

Frenchay campus is under biodiversity pressure as a result of increased development on and around the campus since 2012. Biodiversity is of utmost importance for social, economic and environmental reasons, but also in terms of wellbeing, understanding the value of nature, and providing a positive learning and working space for our staff and students.

9.2.1 Standards

All landscaping projects should deliver minimum 10% biodiversity net gain. UWE's external realm will be managed according to the principals set out in the Building with Nature Standard.

9.2.2 General notes on landscape design and aesthetics

The designer's approach to the public realm and the external spaces in general should be to create sustainable as well as useful spaces which accommodate the necessary functions of urban life and living. The external areas should provide safe linkages to existing areas/features, safe areas for teaching and leisure activities. All spaces should be designed to be welcoming, aesthetically outstanding and deliver high quality green infrastructure.

Pre-existing external spaces should be enhanced through the use of variations in the visual character, orientation, scale, dimensions utilized through to the choice of materials for both hard and soft landscaping (with a view to increase biodiversity where possible).

The design team must consider future management of the external spaces and formulate an external spaces management plan for future maintenance within UWE's ability and resources. This plan must be produced in consultation with the Grounds Manager and delivered as a serviceable document at the completion of the project. This may form part of an access and maintenance strategy.

At the early design stages historic and original environmental features should be taken in to account such as fresh water habitats to either incorporate them in the design or relocate them to a suitable location.

By consulting with UWE Grounds Manager from the preliminary stages of the design (RIBA stage 2 onwards or equivalent), we can ensure designs are sustainable and meet UWE's own standards. Landscaping projects will need to take account of the objectives and approaches set out in the UWE Landscape & Biodiversity Action Plan, available by contacting the UWE Grounds Manager, and all projects that impinge on the external realm shall return at least 10% net biodiversity gain.

Design teams should be aware that external spaces are often forgotten about, especially during refurbishments, or spaces may be missed in between two new buildings. It is essential that projects carefully consider where their boundaries start and stop. Where appropriate, these boundaries may need to be extended to include a wider, external area, ensuring that it is accessible and aesthetically in keeping with the project.

Planting schemes must maintain good lines of visibility throughout the campus, in order to maintain the safety of drivers and pedestrians.

9.3 Soft landscaping

UWE requires the Principal Designer/Principal Contractor to adhere to the National Plant Specification (NPS) guidelines when designing and implementing soft landscaping with specific reference to the NPS handling and establishment code of practice. https://www.csdhub.com/wp-content/uploads/2014/12/The-National-Plant-Specification-Handling-and-Establishment.pdf

In any invitation to tender for plant supply and planting on UWE estates, the contractor must stipulate that the nurseryman adheres to NPS recommendation from lifting until dispatch.

Contractors or sub-contractors must pay special consideration to Part 3 of the code of practice for Ground preparation, Planting and Aftercare.

For large scale landscaping projects an aftercare package, with confirmed start and finish dates must be agreed with the UWE Grounds team prior to any aspects of soft landscaping being signed off as completed. All defects must be attended to during this period prior to landscaping being handed over to UWE for care and maintenance.

Tree planting should be adopted in future developments where appropriate to soften the outline of the built form. Tree selection should be on the basis of appropriate form and growing habit, but all to be clear stem to allow visual sightlines to be maintained. Indigenous tree species should always be considered first if appropriate, deciduous woodland is the type of woodland across the Bristol/South Gloucester region.

Tree selection should be done in consultation with the grounds manager to ensure that any trees or flora planted is in keeping with the campus as well as in line with grounds team maintenance ability and UWE's ambition to increase and enhance biodiversity.

The grounds team will support the design team to comply with ISO14001:2015 standard clause 'emergency, preparedness and response'. This requires use of planting of indigenous trees and flora to decrease soil erosion and interception of precipitation to reduce land saturation/flooding events. Considerate landscape design will reduce the potential impact of changing severity of weather events.

Tree planting benefits through solar shading, wind screening, water processing and retention within the area. Designers should consider where possible, to enhance or include green spaces and trees to improve air quality through 'carbon sinks'.

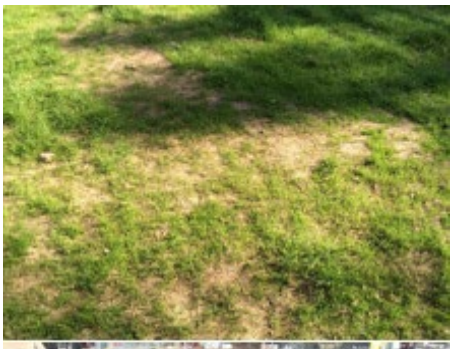
The access and maintenance strategy (see Chapter 2) needs to consider how watering and general ground maintenance will be done efficiently and safely.

9.3.1 Biodiversity

UWE campuses are increasingly becoming urban environments and being encompassed in surrounding residential/commercial developments. Because of this, biodiversity has to be carefully considered to ensure that the maximum social, environmental and economic benefits will be achieved in the design stage through to the build.

At the design stage the designers shall consult the UWE Landscape & Biodiversity Action Plan (available on request from the Grounds Manager) for planting schemes that are appropriate to the campus.

Impacts upon biodiversity must be considered when any project, internal or external is being planned. Impact from external compounds, delivery and storage of materials, scaffolding etc should be taken into account alongside works that have a physical effect upon the landscape. For small and medium sized maintenance or development projects a Biodiversity impact assessment report is available on request from the UWE Grounds team which can assist by providing recommendations and mitigation for the project.
Planting schemes should seek to plant 'nectar rich' native species. 10% of planting must be 'edible' (improving environmental interaction and wellbeing). Planting schemes should seek to enhance the UWE Beeline or Meadowscape projects by the use of nectar rich native and near native plant species and by the addition of edible pollinators from the Beeline Core plant list – available on request from the Grounds Manager. The precise layout and location of be determined in consultation with the Grounds Manager. Specific consideration should be given when designing planting schemes to ensure that inedible or poisonous berries are **not** planted, so as not to be mistaken for edible ones.



Poor care of grassed areas used to store materials or as a traffic route. Grass re-seeding has not taken. The original turf could have been taken up and stored for re-laying.

A trench was dug but not properly reinstated causing a 'scar'.

While these examples may appear to be predominantly the fault of contractors, they can be traced back to poor specifications, lack of involvement of the sustainability team and poor planning (in terms of agreeing traffic management routes or storage locations).

Tree roots were suffocated by excavated soil. These trees ultimately had to be removed at a cost to the University.

Trees were poorly stored (kept in sacks in the open for 6 weeks during the summer) and planted. Combined with poor aftercare, this led to a total of 5 trees being removed & replaced.

Common examples of poor practice to be avoided: These photos illustrate some commonly occurring and easily avoidable, examples of poor practise and their impacts.

9.3.2 Temporary works impacting on soft landscaping

The UWE Grounds Manager must be consulted on:

- Operations or temporary works which impact on soft landscaping must be done in consultation with the Grounds Manager (e.g. use of heavy equipment or creation of temporary footpaths or compound space on grassed areas).
- Proposed locations for stockpiling of soil

9.3.3 Trees

Frenchay Campus includes a number of trees that have been give local authority Tree Protection Order (TPO) status or are classified as significant to UWE Landscape. Both Glenside and Bower Ashton campuses fall within conservation areas and as such all trees within these locations are afforded the same protection as the TPO. It is therefore essential that any project or maintenance works that may have an impact upon UWE trees are discussed with the Grounds Manager at the preliminary stage of planning.

The Grounds Manager will offer guidance to ensure the least environmental impact, including advising on Root Protection Areas (RPA) and the health and condition of existing trees. It is important that all surrounding trees are considered within the scope of the project, not just those that fall immediately within the boundary of specific works. The University expects that BS 5837:2012 'Trees in relation to design, demolition and construction – Recommendations' are followed in their entirety throughout the whole project.

The grounds team will assist in developing the project specification, physically marking out RPA's and will ensure the planning includes actions for the protection (e.g. temporary reinforcement of grassed areas) and remediation of the campus to the original (or better) state. This consultation should take place prior to ground works starting. Project teams will be encouraged to look at improvements surrounding their project boundary.

Please also reference Design Guide Chapter 2, section 2.14 with regard further specification on temporary works. Also regularly review accessibility of temporary signage, access routes, surfaces, hoardings, obstructions and control of dust and noise to ensure that safe inclusive access is maintained during the construction phase.

9.3.4 Memorials

UWE does not promote or encourage the use of 'lasting memorials' such as plaques, tree plantings or benches in memory of individuals who have passed away.

The University Chaplain has identified that such measures can feel outdated or 'tokenistic', especially to young adults. In an age of technology and mass communication, students often use social media to perform a similar function.

There are practical challenges to maintaining and tracking lasting memorials, and inadvertent loss or damage can be distressing and disrespectful to families and friends. Instead, UWE encourages the use of memorial events and there are no specific design considerations that are needed to support these.

9.4 Hard Landscaping

The proposed layout of roads, footpaths and other hard landscaping must be agreed with the UWE transport team. They will help assess the impact on traffic movement around the campus, the impact on crossing points etc. and the potential consequences for disabled people.

In general, designers should comply with the Department for Transport's Manual for Streets (Parts 1 and 2). However, these are largely goal setting and this section offers more UWE-specific guidelines.

Please also reference Design Guide Chapter 2, section 2.14 with regard further specification on temporary works. Also regularly review accessibility of temporary signage, access routes, surfaces, hoardings, obstructions and control of dust and noise to ensure that safe inclusive access is maintained during the construction phase.

9.4.1 Pavements/Footways/Cycleways

2m wide on all sides in order to enable two wheelchairs to pass at the same time.
Routes should be made as inclusive as possible by:

- Avoiding circuitous routes for wheelchair users.
- Placing dropped kerbs with tactile paving at convenient and appropriate locations (which will also assist porters, catering staff etc. using trolleys etc.).
- Achieving gradients that comply with BS 8300.
- A strong tonal difference should be achieved between pavement and roadway and between street furniture and the surrounding paving.
- Careful consideration must be given to the use of 'stripes' (e.g. different coloured modules creating striped bands running across pavements, courtyards etc.) and they should be avoided. For example, for someone with a visual impairment, a dark strip could create the false perception of shadows and a kerb line.
- Resin bonded paths are prohibited at UWE.

UWE does not currently desire shared spaces (where vehicles and pedestrians share the same space), although this is a decision that could be revisited.

9.4.1.1 What UWE means by a 'flush', dropped kerb

For the avoidance of any doubt, a flush, dropped kerb means a 0mm upstand.

9.4.1.2 Pavement Specification

All the following specifications are taken from Gloucestershire County Council manual for Gloucestershire Streets (4th edition), 01/04/16. They are purely indicative.

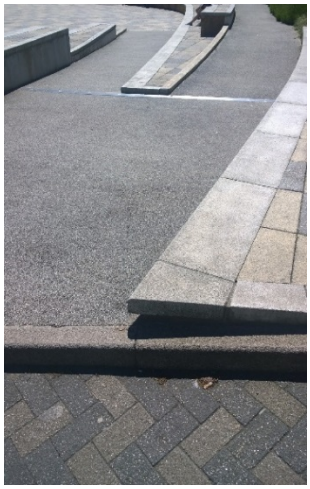
Type	Construction Layer	Thickness (mm)	Material	Binder (Penetration Grade Macadam)	Min PSV of Coarse Aggregate	Max AAV
Footways and cycleways	Surface course	25	AC 6 Dense Surf	70/100	All situations 45	16
			AC 20 Open Bin			
	Binder course	50		160/220		
			Granular Sub Base Type 1			
	Sub base	250				

If paviours are to be used they should meet the relevant council standard (this is indicative):

Type	Layer	Thickness (mm)	Material
Footways / cycleways	Surface	80	80mm (min) thick paver block
	Laying Course	35	Clean sharp sand to BS EN 12620 grading C
	Sub base	225	Granular sub base material type 1

9.4.1.3 Designing out trip hazards

The images below, show low-level trip hazards created by upstands which could have been avoided. A better example is shown in the right hand image below.



9.4.1.4 Lighting

It should be self-evident that effective external lighting reduces the likelihood of trips and promotes a sense of personal safety. Technical aspects of external lighting are addressed in the electrical chapter. All vehicular and designated pedestrian routes will be lit along with 'plazas', pedestrian bridge tunnels, external stairs etc. Designated external escape routes or assembly points will also have emergency lighting.

9.4.1.5 Considering 'adjacencies' in hard landscaping design

Our ambition is to create a harmonious blend of surfaces and designs. Project teams must consider the hard landscaping outside their own project boundaries to create a sympathetic solution. This involves considering and accounting for the new 'desire lines' that buildings will create through the campus.

9.4.2 Specifications for 'private streets'

All main arterial roads through campuses should be designed as a high street as set out by the local authority. This is purely an indicative standard:

Construction Layer	Thickness (mm)	Material	Binder (Penetration Grade Macadam)	Min PSV of Coarse Aggregate	Max AAV
Surface course	30	AC 10 Close Surf	100/150	i) 65 ii) 55	16
Binder course	60	AC 20 Open Bin	100/150	iii) 50 **	
Base course	110	AC 32 Dense Bin	100/150		
Sub base	390	Granular Sub Base Type 1*			

This standard would need reviewing depending on the specific demands a road is exposed to (e.g. if the access and maintenance strategy indicated that heavy items of plant (such as cranes) would need to be deployed on the road).

9.4.2.1 Swept Path Analysis

Depending on the nature of the project, tracking (or 'swept path') analysis may be needed. A 3 axle refuse vehicle should be used for this study and the swept path should be no closer than 500mm from any kerb, vertical structure, tree, or formal parking space.

9.4.3 Car Parking

All buildings are to have an allocation of disabled parking spaces in line with Part M of the building regulations. When providing Blue Badge parking bays, locate these within a short, level distance of the building. In a row of disabled parking spaces, wherever possible, one will be sized to accommodate a large vehicle allowing for a side or rear access hoist.

9.4.3.1 Recharging Points for Electric Vehicles (EV)

UWE seeks to support and encourage the use of electric vehicles. During any projects that will be introducing or extending car parking provision, the sustainability team will assess the need for electric charging points based on number of spaces, proximity to other charging points and the anticipated usage of the space (e.g. a 'drop off' point would not be a sensible location for a charging point as it will encourage drivers to linger).

Generally these will be 'fast chargers' aiming to provide a full charge in 1hr 30minutes. This requires a 22kW supply (approximately). The charging points are to have Ingress Protection rated at 55. Charging points are to be individually metered (as detailed elsewhere in this design guide).

9.4.4 Motorcycle Parking

Provide space for at least one 3 wheel tricycle in any parking designed for motorcycles.

9.4.5 Cycle Parking

UWE has used a range of options to provide comfortable, aesthetically pleasing, well lit and reasonably secure cycle parking facilities. The requirement for or size of this provision will be influenced by the number of building users, the proximity to existing facilities etc. as well as constraints such as space.

Designers should consider wind loading/direction when selecting and positioning bike shelters, especially open faced shelters.
Shelters should not be positioned in infrequently used or obscured locations, as this could encourage theft. The transport team will advise on security requirements, but it should be anticipated that cycle hubs will need swipe access with attendant power/data supplies.

The sustainability team should be consulted during RIBA stage 2 of any major refurbishment or new build (£2.5m or more exc. VAT) so that they can assess existing provision and advise on how cycle provision could be enhanced.

In any cycle parking provision, there must be at least one cycle space that is wide enough to accommodate a recumbent trike which may be used by a disabled person. There will also need to be space for storage of a wheelchair.

9.4.6 Barrier Controls

Barrier controls should be operated by swipe cards or key codes (the transport team will advise) and without the need for users to leave their vehicle. Intercom is only a 'back up' method of operating barriers: Not all users will have hearing or speech. Barriers must be designed to prevent harm or damage to people or property.

9.4.7 Designing for deliveries, maintenance & emergencies

The access and maintenance and fire strategies will help establish the demands that will be placed on hard landscaping. UWE wishes to avoid the need to repair brand new footpaths etc. damaged by the weight of vehicular traffic which was foreseeable from the outset.

Designers must ensure that there is at least one vehicular route and parking area for each building, capable of taking the weight of a 3 axle refuse vehicle.

9.4.8 Pollution prevention

Hard infrastructure should include appropriate pollution prevention measures. The UWE Sustainability Team (Environment Officer) can provide advice on, for example, the requirement for interceptors or the risk to existing drainage (e.g. surface water drains in proximity to a new delivery bay).

Any external spaces that the sustainability team deem to be high risk such as loading bays or near hydrocarbon storage tanks may need storage for a UWE spill kit (depending on the distance to an existing kit). This will need to be allowed for in the design process.

9.4.9 Underground Services

A range of services and cables are routed through the ground. This makes them vulnerable to inadvertent damage, especially during future construction projects.

Designs, specifications and installation must conform to the current version of NJUG National Joint Utilities Group's guidelines and BS 1710 on the positioning and colour coding of underground utilities' apparatus.

Where possible, all utility apparatus should be laid in 'corridors' throughout the site. This will facilitate the installation of the services and any future connections as the development proceeds. Consideration should be given to the use of trenches and ducts to facilitate this. When trenching, coordination is expected to provide suitable and sufficient excavations to accommodate mechanical, electrical, and data requirements. A minimum 50mm data duct at 350mm depth should be considered to be provided in any trenching work.

Due to the ever evolving nature of the estate, depths must conform to 'carriageway' standards and not footways or verges: Within a matter of years road surfaces could be extended or re-routed.

If for any reason, minimum depths or separation distances cannot be achieved, the situation must be discussed with the relevant UWE engineer.

The location of access to inspection chambers should be carefully considered in order to:

- Facilitate permanent but safe access

- Limit the impact on traffic/pedestrians while in use
- Prevent damage to the manhole cover from vehicular traffic

9.4.9.1 Marker and identification tape

Identification tape (which must be PVC or polyethylene ribbon at least 150 mm wide) is to be applied continuously along the whole length of underground services. The relevant descriptive text should not be more than 700mm apart. The tape should incorporate a corrosion resistant tracing system.

The tape should be installed directly over the crown of the pipe for its entire length. This tape should be extended and then terminated within suitable accessible points at either end of the pipe run (valve chambers & building entry points etc.) to facilitate future tracing via signal generation method.

Regardless of the service being installed, the trace wire shall be designed and attached in accordance with the Bristol Water Addendum to Code of Practice for the Self-Laying of Mains and Services (version 4.0, November 2014). "Trace wire shall be attached to the service pipe using plastic cable ties at not more than 1 metre intervals. The wire is to be minimum 1.5 square millimetres blue plastic coated wire to BS 6491X standard. The wire shall be taken into the property."

The final termination point will need to be determined by the exact service. In the case of water pipes, the Bristol water addendum states "they should be clamped to the service pipe above the stop tap, and shall terminate above the main to which the service is connected."

9.4.9.2 Entry of services to buildings

To maximise resilience to cope with damage, planned outage etc., diverse routes are required for service distribution. Typically, risers are provided at opposite ends of the building.

9.4.10 Fire hydrants

The requirement and position of fire hydrants will be determined by the fire strategy for the building. UWE has a full suite of drawings showing the existing hydrant circuit and can provide water pressure data. The design must conform to current versions of relevant British and Industry Standards (BS9990, BS 750 and BS EN 14339, in this instance).
Fire Hydrant marker posts shall be set in concrete to anchor them into the ground. The posts shall be as manufactured by "Elite Precast Concrete" type Hydrant Post – CG305A.
The "H" signs shall be supplied by "Safety Sign Notices Ltd".

In line with recommendations from UMAL, the UWE insurers, all fire hydrant covers must be highlighted by yellow paint. This is in addition to the marking requirements in BS 750 ("surface box covers shall be clearly marked by having the words "FIRE HYDRANT" in letters not less than 30 mm high, or the initials "F.H." in letters not less than 75 mm high, cast into the cover."). UWE requires the use of "FIRE HYDRANT", rather than "F.H." unless space constraints prevent this.

All hydrants must be installed to allow fully accessible maintenance.
Handover documentation for each hydrant from the Contractor shall include:

- Certificate of Conformity in line with BS9990.
- Flow test in Litres per minute
- Pressure test in BAR
- Signage information
- Pit and cover information
- Depth of valve

9.4.11 Drain Covers

In line with Pollution Prevention Guidelines (PPG) 1 and 22, UWE requires that: "gullies, grids and manhole covers are colour coded to aid identification, using blue for surface water and red for foul and arrows to indicate the direction of flow."

It will hopefully be self-evident that colour-coding will hugely assist in the management of the Estates. For example, in the case of a spill, it will help a response team to rapidly determine which grids to prioritise for protection.

9.5 Street Furniture

The DfT Manual for Streets establishes how detrimental 'clutter' can be to the public realm.

Chapter 3 of this design guide addresses wayfinding and the strategy for ensuring that signage is used in a coherent manner and presents a visually consistent theme.

Any other street furniture should be robust with a design that is sympathetic to the surrounding built and natural environment (e.g. the requirements of central Frenchay campus will be different from Glenside).

Where possible any proposed street furniture should be integrated into designed elements, such as paving bands.

9.5.1 External seating

There should be a mixture of external seating, offering opportunities for individuals to rest as well as collaborating together on course work etc. Seating should include some with backs and arm rests, providing a selection that people can pick to suit their health and physical condition. The design and material will need to match the environment. If there is space for only one external seat, it should be fitted with arm and back rests. An example (found at another University) is shown below.

9.6 External Events

UWE's desire for flexibility extends to external spaces. Any large area of soft or hard landscaping should be considered as a potential events space (e.g. talks, performances, street catering etc.). This should be discussed with the end user(s) and sustainability team. If external events are desirable, provision should be made for power, lighting etc.

9.7 Waste Handling & Storage Facilities

External waste and recycling facilities should be designed in consultation with the Sustainability Team, in particular the Waste and Resources Manager, to ensure the appropriate facilities are designed to meet the needs of the users and waste contractors.

Facilities will obviously take into account the size and quantity of containers for waste. Where possible bin stores will be enclosed or, if that is not practicable, sheltered to aid with secure waste containment in line with legal obligations.

As an overarching principle the design team should follow the guidance for waste handling/storage provision as given in a BREEAM assessment: The space recommended by this assessment is in direct proportion to the square meterage of the building.

The design team should note that UWE have a priority on recycling. Hence, the wider design should include space for bins and recycling points across all areas of the building i.e.

offices, kitchens, eating areas, study areas etc. The design team will additionally need to consider ease of access for cleaners, both for storage of materials and access whilst undertaking the cleaning of the buildings.

Any bin stores provided should have enough space for 1100 litre recycling and general waste bins to be moved in and out of the bin store and have good access/space/head height for cleaners to empty smaller bins into them. The exact number of wheelie bins required will depend on the occupancy and use of the building; exact specifications for this should be determined in consultation with the relevant UWE personnel, including the Waste & Resources Manager.

Bins stores will need to be positioned 10m or more from a building for fire and insurance purposes. If this is not possible, advice must be sought from the UWE Fire Officer and the UWE Insurance Manager.

Approximate bin dimensions for the different waste streams are shown below:

	General Waste	Plastic and Cans	Paper and Card	Glass	Food
Container size	1100 litre	1100 litre	1100 litre	240 litre	140 litre
Container dimensions	Width: 1265mm Depth: 984mm Height: 1280mm	Width: 1265mm Depth: 984mm Height: 1280mm	Width: 1265mm Depth: 984mm Height: 1280mm	Width: 585 Depth: 740 mm Height: 1100 mm	Width: 505 mm Depth: 555 mm Height: 1100 mm

Building plans should include the dimensions of the bin store and indicate the correct number and type of bins in each store. The plans will need to demonstrate that the bins will fit within the proposed bin store area with sufficient room for access and manoeuvring.

Please also note that bin stores should be arranged so that all bins are accessible at all times. There should be sufficient space between bins to allow access for both UWE personnel and collection operatives. This will help to avoid issues with waste being left on bin store floors and non-collection by contractors.

Bin stores should ideally be as large as practicable to future proof against any potential changes in collection methodology resulting in a larger quantity of bins being required. Larger bin stores will also allow the minimum number of weekly collections to be scheduled therefore keeping vehicle movements on campus to a minimum.

Other considerations for the bin stores include, but are not limited to: lighting, drainage, Category 5 water points, easily cleanable impermeable surfaces, signage boards, hand sanitiser units, access requirements, etc.

Lighting should be adequate and easy to repair. It is essential that bin stores are well lit to allow bin signage to be read, to promote proper use and to counteract concerns about them

feeling dirty or unsafe. It is recommended that lighting is controlled by motion sensors to avoid it being left on when bin stores are not in use.

The appearance of the bin stores should also be considered, such as whether it is possible to make them 'attractive' as well as functional. There are potentially opportunities for in-built behavioural psychology and 'nudge' elements in the design of bin stores to try and increase recycling outcomes.

Bins stores must be external to main buildings, and located at least 10m away from all buildings, as required by our insurers. If this is not possible, advice should be sought from the UWE Fire Officer and Insurance Manager.

With regards to the development of residential buildings, Schedule 1, Part H of the Building Regulations (2000) states that residents should not be required to carry waste more than 30 m (excluding any vertical distance) to their waste storage point. For non-residential buildings consideration should be given to the distances that cleaning staff will be required to transport waste from the building to the bin store.
Access to the bin stores will be required by refuse and recycling contractors' vehicles.

- The gradient between bin store and collection vehicle should not exceed 1:12 (Building Regulations, 2000)
- The distance over which containers are transported by collectors should not exceed 15m for two-wheeled containers, and 10m for four-wheeled containers (BS 5906: 2005)
- The route between the bin store and the collection point should be free from steps (HSE) and any uneven surfaces

Access to the bin stores will be required by refuse and recycling contractors' vehicles.
UWE has a 'forward gear only' policy for waste collection vehicles on UWE campuses. Contractor access to bin stores should be designed in such a way that reversing is not required.
Waste contractor access to external bin stores must be addressed in the Access and Maintenance Strategy.

Any design should include the facilities to store hazardous waste. This will range from fridges, to chemicals/contaminated cleaning containers to TV's through to chemicals storage requirements. The design team must ensure adequate Health & Safety precautions are in place including eye washes etc.
Hazardous waste storage and collection is not included in BREEAM calculations, the exact requirements will depend on overall size/use of the building. In specific situations, depending upon the faculty in question, there may be a need to provide external space to accommodate lockable skips.