

# UWE Estates and Facilities Design Guide

## Chapter 2: Design Governance



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## 2.1 Change Control

Version Number	Date of Issue	Chapter Ref	Brief Description of Change(s)
1.4	01/05/19		Numerous updates throughout as detailed in 2019 version
1.5	NOV 2019		Various updates to 2.6 & 2.12
2021	JAN2021	2.4	Aesthetic section from Chapter 1 incorporated into this section so it is not duplicated.
2021	JAN2021	2.5	Designing an Experience section added to this Chapter and removed from Chapter 1.
2021	JAN2021	2.5.3	Added: Fire safety is a critical consideration. Automatic Fire Detection to L1 must be fitted in all UWE accommodation. Only induction hobs are to be provided due to fire risk. Hob fire safety controls must be installed, as per UWE Electrical Design Engineer guidance.
2021	JAN2021	2.6.1	Amended in table of 'undesirable options': "Maintenance workers having to enter occupied rooms (especially teaching room or student accommodation flats or houses) to access technical areas"
2021	JAN2021	2.7.4	Section added on Waste disposal facilities
2021	JAN2021	2.10	Added: "This is essential to achieve UWE's 2030 net zero carbon strategy."
2021	JAN2021	2.11	Softlandings details remove need to comply with BSRIA standard.

## 2.2 Introduction to Design Governance

The purpose of this chapter of the design guide is to set out how UWE expects the design process to be managed. Specifically, it explains:

- The need to consult relevant stakeholders and identifies who they might be
- How the Construction (Design and Management) Regulations need to be approached at UWE
- The role of UWE staff responsible for Technical Assurance and management of derogations

- UWE's approach to BIM and drawing standards
- UWE's approach to life cycle costs, softlandings and post-occupancy evaluation
- The need to design an estate which is resilient and easy to maintain and clean
- The management of temporary work design

## 2.3 Consulting to create a usable design

Designers will need to engage a range of stakeholders in a timely manner to create a functional design. On a project-by-project basis, the team must determine who needs to be consulted, how and when (UWE project processes provide an aide memoire).

Designers must consult the Lessons Learnt folders from previous projects

These stakeholders inform design and project planning by explaining requirements, sharing expertise or consulting with their own stakeholders. Do not assume knowledge of how spaces will be used or expect one stakeholder to have all the answers. Examples of how they can help are:

- Faculties can establish student user groups to help develop briefs and assess proposed designs.
- Cleaning services can test the 'cleanability' of proposed products where they deviate from UWE standards and advise on the impact this will have on cleaning regimes and costs.
- CETTS (Central Examination and Time Tabling Service) can report on current space utilisation and model the space requirements or impacts of a proposed project.

The following is a list of the UWE internal stakeholders which project teams may need to liaise with, but is not limited to:

- End users. This may be:
  - Academic & technical staff
  - The library
  - The Centre for Sport
  - Accommodation services
  - Student Union
  - A professional service
- Catering
- MTC service provider
- Community Liaison Officer
- Travel and access
- UWE Marketing
- Hospitality Services
- IT Services
- Insurance manager
- Equality & Diversity
- Faith & Spirituality
- Printing and stationary
- Security
- Health & Safety team inc. fire and construction leads
- CETTS
- Sustainability team
- Grounds team
- Energy team
- Business risk management
- Cleaning Services

## 2.4 Aesthetic and visual impact

Designers are encouraged to create buildings and spaces that produce visual impact and inspire users. The internal design and fit out must strive to maximize the student experience.

Experience at UWE has confirmed that less conventional designs require close attention to co-ordination and quality assurance.

To meet the expectations of our students, it is important that UWE is 'de-institutionalised'. This is reflected in our branding but must be conveyed by our built environment.

Each faculty will also have its own aesthetics, depending on the subjects it teaches and the demographics and expectations of students. Some strive for a corporate look, others aspire to be relaxed or artistic, while others may want or need a clinical, scientific or industrial appearance.

While this design guide encourages standardisation (to help achieve best value), designers must accept that each project will need to be judged on its own merits.

Regardless of these variations, any teaching walls (i.e. walls on which images are projected) must be painted 00NN 16/000 – Grey. This accentuates the screen and benefits students with certain cognitive or visual impairments who might struggle if faced with a large, white wall.

Designers must ensure that any project's physical impact on the surrounding area, local communities and environment is in keeping and must satisfy the Local Authorities requirements.

Designers must ensure that any proposed development maintains well-proportioned routes and spaces. Hard and soft landscaping must be used to ensure that buildings complement their surroundings and a sense of softening the outline of the building is achieved. At the edges of any development, the design team must ensure that an open, accessible and active interface is achieved with the surrounding areas on all elevations. Effective co-ordination is required between all the design disciplines to achieve the overall, desired standard of appearance.

## 2.5 Designing an Experience

By altering our built environment we are 'designing an experience' for our students and staff. The Higher Education sector has radically changed since these design guides were first issued in 2011. It is increasingly important that we offer attractive, inclusive, sustainable and functional learning, teaching, social and living environments, or environments that blend these roles. Our built environment must be flexible enough to cope with changing demands and teaching methods.

It is only through consultation that we will determine how the built environment will effectively support and impact on the student experience, remembering that no two faculties are the same. There are various and different stakeholders at UWE.

### 2.5.1 New Pedagogical Approaches

The traditional model of education involved a tutor disseminating information to a fairly passive group of students in a classroom setting. Students might complete work outside of the classroom. As technology developed, these outside activities moved to a digital format ('blended learning').

There are now very different approaches to education with an increasing move towards active and collaborative learning experiences. In a 'flipped classroom' approach, group work, discussions and individual/self-directed learning occur within the premises, facilitated by the tutor, and traditional teaching may occur at home with students watching online presentations. Lecture capture is therefore now a standard UWE requirement in teaching rooms. This technology also gives some disabled students or students with caring responsibilities etc. new options for accessing lectures. Clearly, laboratory or workshop-based classes will have very specific requirements.

On average each student has 3 electronic devices and uses them as an integral part of their learning experience (e.g. videoing lectures to review at their own pace or making notes on tablets). This leads to vastly different power requirements than when the University was first built (and challenges for bringing power to desks etc. within large floor areas). The faculty is best placed to explain their pedagogical approach, how this needs to drive design and their expectations of how this may change in coming years.



Seating areas in corridors allow students to engage in directed discussions or participate in informal mentoring. These facilities also offer opportunities for people to rest as needed.



A collaborative workstation, creating a pod connected to but separate from adjoining corridors. It overcomes the institutional (and potentially disorienting and intimidating) appearance of long, featureless corridors.

A collaborative workstation, within a learning zone, facilitates discussion. Cabling enables shared use of a monitor. High backed sofas create a 'booth' while the lightweight chairs can be moved to enable a wheelchair user to make use of the space, although it would have been preferable if one of these chairs had arm rests to help people sit/stand. Technology is embedded into these workstations, with USB charging points, video capture, etc. This enhances the flexibility of these spaces, taking away a need for video conferencing suites, and mirrors how students use technology in their day-to-day life.

Traditional teaching methods are still needed. While tiered seating is sometimes used, new styles of layout are emerging. They all present practical challenges. For example, access to fixtures or equipment, such as projectors, above tiered seating needs careful thought. These rooms often have

fixed seating and some rows may be inaccessible to someone with mobility impairments. An entire row or section of moveable furniture at the front and back of the room (as long as they are accessible) gives people choice about where to sit, so they will not be stigmatized by sitting in a 'disabled area', and offers space for assistive equipment and support. Multi-functional spaces can be used for many purposes and will be utilised much more effectively than single-use spaces. UWE is then not heating, cooling and cleaning empty spaces.

Social spaces can become self-directed or collaborative learning zones with appropriate choice of furniture and provision of power.

A flexible learning space is often presented as a large space with wheeled/reconfigurable tables and chairs enabling a room to be set up in a variety of patterns. Furniture selection will influence how accessible a facility is. UWE expects designs to incorporate tables at varying heights, with good space beneath to accommodate wheelchairs. Seats with arms will assist someone to stand if they need additional support. Lightweight furniture, with hand holds, can be easily moved. Other, more progressive ideas include:

- Wheeled bookshelves/cabinets enabling the layout of a large space to be reconfigured.
- Use of acoustic blankets as room dividers. Worktables with pull down power enabling them to be used in different locations and for different purposes (down for laptop/tool use, up for discussions and model-making etc.).
- Provide sufficient space at PC terminals to enable students to work with 'study-buddies'. This could benefit disabled students who are supported by assistants.
- It should also be noted that flexible spaces are also a key component of our business continuity strategy: We can quickly reconfigure areas to accommodate different functions in the aftermath of an incident. Large spaces are also generally more accessible, presenting fewer doors to navigate.
- The provision of building services (and IT infrastructure for AV equipment and video capture technology etc.) needs careful consideration if large areas can be reconfigured, in order to prevent creating zones which could be overheated/cooled, or areas which could be inadequately serviced.
- The room booking system, connected to tablets, enables the University to utilise space much more effectively and hands control over to the individual. You are able to quickly check whether/when rooms are available and you can book the space. This creates a more flexible, agile and empowering learning experience.

### 2.5.2 Laboratory / Workshop Design

Laboratories and workshops have requirements above and beyond traditional teaching spaces. In some cases, this includes a need for safety features such as door interlocks and high levels of containment to prevent inadvertent release of substances. UWE requirements are detailed in:

- UWE Health and Safety Standards, available on the UWE Intranet
- General, discipline-specific requirements are contained in later chapters of this design guide

Some equipment or processes have specific operational requirements (e.g. in relation to humidity, temperature or dust control) which cannot be described here or in health and safety standards.

Achieving these standards requires a co-ordinated response from the entire design team. At RIBA stage 1 (i.e. while discussing and developing the client brief), the UWE Project Manager will identify specialist spaces within their project scope. Project management processes ensure that:

- Appropriate stakeholders are consulted.
- Seek advice from the UWE Health and Safety Team's specialist advisers on Category 2 Laboratories, Biological Safety, Radiation Protection, etc who should be consulted where such specialist labs are being designed.
- Refer to Health & Safety Standard on Biological Safety, which names some of the roles that should be involved in design and planning of work in laboratories and workshops.
- Capable, specialist designers are appointed
- Appropriate Estates staff provide Technical Assurance (as discussed in Chapter 2)
- A plan is put in place to ensure packages of design are co-ordinated

Principles of accessibility and inclusivity must be embedded in design e.g. providing some work tables of different/adjustable heights and a mixture of seating, offering some with arm and back rests. Offering these in different locations in a room prevents creating a 'disabled area'.

### 2.5.3 Student Accommodation

Many students live on campus and their accommodation has a significant impact on the student experience. Typical accommodations consist of a number of en-suite flats with shared kitchen facilities, town houses, and some studio flats are also available. As part of its commitment to inclusivity, UWE offers a range of options to make on-site living an affordable proposition to students from different backgrounds.

There are no standard templates for accommodation. Student expectations change and it is essential that design teams consult with accommodation services and review existing provision (in and outside UWE) as they develop designs. It is crucial not to have pre-conceived notions.

Fire safety is a critical consideration. Automatic Fire Detection to L1 must be fitted in all UWE accommodation.

Only induction hobs are to be provided due to fire risk. Hob fire safety controls must be installed, as per UWE Electrical Design Engineer guidance.

Appropriate numbers of student flats must be provided that are fully accessible and can be readily retrofitted with assistive devices. Regardless of whether the flats are designed to be accessible it is important that communal areas are accessible as students may receive disabled visitors.



## 2.6 Project Governance

### 2.6.1 Project Management

Effective project management ensures that project objectives are met. Projects are to be managed with regard to the principles set in Achieving Excellence in Construction suite of Procurement Guides.

It is crucial that designers refer to and help clarify the client's brief to establish what is in and out of scope. The client's budget for the project may include the cost of certain items required post-completion and during the project's operational use.

### 2.6.2 Standards governing design work

UWE Policy for new buildings or refurbishments of £500k and above, SKA should be adhered to. For smaller projects, this is at the discretion of the UWE Project Manager.

All Projects will be, as a minimum, designed and constructed in compliance with but not limited to:

- All relevant Acts of Parliament, Statutory Instruments and associated codes of practice or guidance
- The requirements of the Building Regulations
- All relevant EN Structural Eurocodes
- British Standards, Specifications and Codes of Practice, including BS 8300 'Design of buildings and their approaches to meet the needs of disabled people — Code of practice'
- The requirements of the Local Authority and Utility companies
- Standard UWE Specifications
- BRE Green Guide for Specification
- The BREEAM rating which has been agreed or other, relevant standard. This may include RICS SKA HE but this needs agreeing on a project-by-project basis as this standard may not be appropriate for all projects.
- The LPC Design Guide for the Fire Protection of Buildings.
- CIBSE guidance.
- BSRIA guides that are specifically referred to in the text of the design guide.
- Loss Prevention Standards (also known as Red Book Live)

All as current at the time of appointment and further revisions prior to final design sign off.

UWE will require design teams to evidence – or may seek to verify for itself – that these standards have been complied with. The UWE Project Execution Plan sets out the steps to achieve this.

In addition, standards such as ISO 14001:2015 environmental management system inform UWE's strategies and will therefore indirectly impact upon design.

A number of Chapters of the design guides are specifically written to explain how the above standards are to be interpreted and applied in UWE and may introduce additional standards.

### **2.6.3 Construction (Design & Management) Regulations 2015 (CDM)**

UWE has a suite of documents setting out how it will comply with its duties as a Client and where relevant, as Principal Designer and/or Designer. As a general principle, UWE will seek to appoint the designer with most control over the design team as Principal Designer.

Designers must identify and manage risks associated with their designs, to the people who are constructing, adapting etc. their structures (now or in the future), the people who are maintaining or cleaning the structure or the people who will ultimately be using their designs.

#### **2.6.3.1 *Design risk management***

As a client, UWE has identified design features that create or mitigate risks for future maintenance and for users of their buildings and infrastructure, or which may pose risks to staff or students in the vicinity of construction projects. The UWE design guides may take the following actions:

- Insist that certain design features must be included or excluded
- Encourage or discourage certain design features

If a design feature is discouraged, yet there is a compelling case for including that feature, it must be evaluated using a design risk register and discussed with the UWE project lead and principal designer.

Designers must be aware of the HSE's 'Red, Amber and Green' list of design features which appears in the industry guidance for designers. If a designer wants to include any 'red' or 'amber' design details they must also record these on the risk register.

The principal designer will help to determine precisely how risks are recorded and tracked. As part of this process it is critical that designers consider and record how the new structure, plant and services will be maintained. As explained later, this information must be included in the health and safety file.

Designers need to be mindful that the population in a higher education setting is not the same as in a commercial, retail or other urban environment. One of the key differences is that there are peaks of population movement which designs must accommodate.

#### **2.6.3.2 *Designer's responsibilities for risks during the construction phase***

Designers can influence the risks posed to staff, students, UWE operations and contractors during the construction phase.

UWE has a Contractor Safety Pack that sets out requirements and expectations of contractors on UWE sites, e.g. stipulating the minimum separation distance between buildings and skips, the standards of site protection, loss prevention standards for sheeting. It also highlights site-specific hazards that project teams need to be aware of, such as hazardous vents on certain roofs.

All designers and project managers **must** review the contractor's safety pack and consider how their own decisions will affect the contractor's ability to comply. If the project team imposes excessive constraints on a project (e.g. in terms of time and space) it may not be possible for contractors to comply with the Pack. Alternatively, the project team could make decisions that create subsequent delays or risks because hazards were not identified and mitigated early enough.

From the earliest stages of the project, the team must be considering:

- What surveys etc. are required to identify hazards and agree how risks can be mitigated, perhaps through changes of design or project scope.
- The logistics for delivering a safe and efficient project. Consider site boundaries, compound space, traffic routes for construction traffic and likely sequencing/timing of work (which could be reduced by pre-fabrication). This information must be reflected in contract documents and the package of pre-construction information. Enabling works packages may be needed.
- Services must be protected - When making connections to existing services, the project will need to determine the condition and capacity of the existing services and upgrade where necessary. Where services to occupied buildings will be disrupted, the scope of the project must include provision of alternative supplies in advance of diversion or disconnections.
- The project must consider and mitigate the impact on access routes to and around the site (for pedestrians, construction traffic, UWE deliveries, maintenance operations, emergency vehicles etc.). See the section on temporary footpaths, later.
- Developing a site constraints plan to convey the 'buildability' constraints and challenges.

### 2.6.4 Management of occupied buildings including sequential handover

After balancing a range of competing risks, costs and constraints, a decision may be reached that the building being altered will remain partially occupied throughout the course of the works, or there will be staged handover. Public protection measures and/or the handover programme must be established in as much detail as possible before tendering for the principal contractor (so that they will allow for this in their costs and programme etc.). The softlanding process will help the project team to establish a well-managed handover programme, including identifying what certificates and warranties will need to be in place before any handover commences.

### 2.6.5 Departures from Standards and Specifications

While trying to set out minimum standards in these design guides, the University does not wish to stifle innovation. Innovation is a core value of Strategy 2030 and design teams are encouraged to be creative and forward thinking. UWE will accept departures from standards/specifications. These departures may be allowed if there is a specific and direct advantage to the University.

Economic advantage will be evaluated using a whole life cost model to ensure that the university obtains value for money through the life of the building. There may be factors other than economic that may justify a departure from standard. UWE project processes describe how departures from these standards will be managed using the derogation process. Design teams must also be aware that UWE will ensure a technical assurance function is allocated to certain projects who will review/comment on design proposals.

### 2.6.6 Technical Assurance

UWE contract and project management documents set out how technical assurance is to be managed which will vary depending on the size and complexity of the project, the form of contract etc. Designers will be informed what design information (including specifications) need to be submitted, when and to whom and the process for discussing and resolving queries or reviewing and approving derogations.

Projects must have a drawing release schedule which will ensure that the pre-construction phase is being adequately managed and co-ordinated (including ensuring designers are being given adequate time), designs are progressing in a timely manner and that individuals in technical assurance or principal designer roles have sufficient time to discharge their own duties.

To support this process, UWE must be provided with co-ordinated design details and drawings. Co-ordinated drawings are essential: Issuing disembodied designs for comment will raise problems predominantly through the interface with other designs. Use of BIM (discussed later) will support more effective design co-ordination.

### 2.6.7 Named, Specialist Contractors

Design teams must be aware that UWE will sometimes require the use of named, specialist contractors who have design responsibilities. It is the responsibility of the lead designer (supported by the Principal Designer) to ensure these packages are co-ordinated with the overall design.

## 2.7 Designing for Facilities Management & Maintenance

The demands of operating, maintaining and managing a new structure and plant/services is a fundamental part of the design process. It requires a co-ordinated response from all disciplines.

An Access and Maintenance Strategy (including plant replacements) must be provided on all projects (unless agreed otherwise). An outline Access and Maintenance Strategy must be produced during RIBA Stages 2 & 3 consisting of descriptive text and supporting drawings to show the provision for safe and practical maintenance and replacement. It must address the following as a minimum:

1. The assets which require maintenance / require access to them.
2. The maintenance those assets require / reasons to access them.
3. The frequency of these maintenance activities / likelihood of reactive access requirement.
4. How long these activities might take.
5. Expected design life of the assets i.e. how long before access is required for replacement

A detailed Access and Maintenance Strategy must be developed during RIBA stage 4. Before the project proceeds on site, the documents must be reviewed by the Principal Designer, UWE Operations & Maintenance team, and staff responsible for Technical Assurance. The document forms part of the Health and Safety File.

The first year of maintenance of some items of large plant (e.g. lift, boiler, chiller) will be the responsibility of the Principal Contractor. This will be clarified in contract documents. The intention is to encourage project teams to carefully consider 'maintainability' at design stage and, in the pre-tender stage, to identify maintenance responsibilities.

### 2.7.1 Design features to improve access for plant/technical areas

Designers must apply "Defence Works Functional Standard, Design & Maintenance Guide 08: Space requirements for plant access, operation and maintenance" to determine access/maintenance space requirements, particularly within plant rooms. As a result, adequate space for maintenance, removal and replacement must be provided around all plant (to a minimum of manufacturer's requirements). Chapters 6 and 7 of this Design Guide explain that UWE will require the adoption of BSRIA BG6 on projects with a construction value of £2.5M (exc. VAT) or more. This will help ensure adequate space is provided.

The table below sets out UWE's preferred and undesirable options relating to some recurring issues that have rendered buildings difficult to access, maintain, or clean. If a design team plans to introduce an undesirable, the derogation and change management processes must be followed and the proposal accompanied by a design risk assessment. This assessment may be an entry in the design risk register but may potentially be a more detailed justification explaining the constraints that led to this design. If approved, the proposed management of the issue must be fully addressed in access and maintenance/plant replacement strategies starting in RIBA Stage 3.

Most Preferred Options	Undesirable Options
External plant in a ground level, secure compound or in a dedicated ground floor plantroom with external, vehicular access	Roof mounted plant. In this case, the plant replacement strategy must explain how crane operations will be managed Internal plant areas (requiring large items of plant and equipment to be moved through the building)
All plant and maintainable components accessible from permanent walkways	Lights, sensors etc. that require specialist access equipment, closure of access routes and/or extensive work at height to maintain <b>or</b> a requirement to work above tiered lecture seating
Light fittings/sensors etc. that can be reached with minimal work at height (e.g. low level lights with high level reflectors)	
Technical areas accessed from circulation routes (or a dedicated, external doorway)	Maintenance workers having to enter occupied rooms (especially teaching rooms or student accommodation flats or houses) to access technical areas
Plant within buildings can be removed/replaced without dismantling the surrounding envelope	The need to dismantle elements of the structure/ envelope (e.g. sacrificial panels, bulkheads, casing) to remove/ replace plant or to access flanges/valves
Access to technical areas (or roofs which require maintenance access) via an extension of the stair core	Access to roofs/technical areas by ladders
Plant areas with sufficient space to reasonably accommodate changes in future (e.g. to cope with a changing climate) including space to erect lifting gear	Plant areas that are sized to the minimum acceptable thresholds with no space for future changes
Walkways clear of floor mounted or low level pipework/ducts which create the risk of trips and damage, or require workers to stoop.	Obstructive pipework/ducts (which must be suitably protected from damage or causing harm). Ducts/areas that operatives must crawl to enter or reach. If proposed, the design must comply with BS 8313 Code of Practice for accommodation of building services in ducts. Maintenance workers having to enter a confined space.
Materials drawn from UWE's standard specifications and can be cleaned using standard equipment	Bespoke materials, especially if they need specialist/unique equipment or processes to clean.

In addition, the following measures must also be observed:

- Escape routes within plant rooms/areas must be well defined. Where determined by the fire strategy, there shall be a second means of escape provided.
- Where plant is roof mounted (other than on concrete plinths), a clearance of 450mm must be maintained below any item of plant, pipework or ductwork running on or across roof finishes to enable roof maintenance to be carried out without the need to remove or raise services.
- UWE contains a number of areas where access is restricted due to hazardous processes e.g. laboratories. Isolation valves etc. must be located outside of these areas so that, in an emergency, supplies can be shut off without exposing workers to risk.

### 2.7.2 Lessons Learned

In addition to the items above, UWE have encountered a range of other problems that must be avoided in future. These can be provided in full by the UWE Project team, and they include, but are not limited to:

- 1) Constructing upstands on roofs that require louvres and damper blades to be removed to give access to motors and actuators. With the blades removed, a 5 storey, unguarded fall is created. Hatches would have enabled the actuators to be accessed from a position of safety on the roof.
- 2) Designers specifying end of line products as a cost saving exercise, meaning that spare parts are no longer produced and the plant is obsolete on the day it is installed.
- 3) Risers which employees could or need to enter but which lack a load bearing floor
- 4) No, or inadequate fire stopping provision. No, or inadequate fire stopping labelling and details.
- 5) Mechanical installations (or elements thereof such as pump heads) lacking details of weights, lifting points etc. leading to delays and complications during replacement/removal
- 6) Handover documentation has historically not detailed the management strategy if plant/equipment removal/replacement requires the use of cranes, lifting beams, sacrificial panels etc. or other activity that pose operational difficulties or a significant risk to contractors or UWE staff, students or assets.
- 7) Constructing canopies on the side of existing buildings, preventing access for window/gutter cleaning and with no alternative strategy being considered.
- 8) Plantroom thresholds which render it difficult or impossible to use wheeled, mechanical lifting aids to transport plant and equipment.
- 9) Ensure that tenders span the Pre Tender Estimate to prevent automatic choice of lowest tender.

### 2.7.3 Facilities for cleaning

Buildings do not clean themselves! Designs need to provide adequate facilities to facilitate cleaning. The requirements for a typical cleaning store are set out to the right.

During the design phase the housekeeping team will determine the Cleaning Strategy based on the proposed structure (including surface finishes etc.) and activities within it.

The strategy may go through various iterations and become progressively more detailed as the design develops until a Cleaning Procedure is produced as one of a suite of Handover Documents. Specific items

- A hard, impermeable floor surface
- Plenty of storage space
- Adequate ventilation & temperature control (to aid drying and preserve correct chemical temperatures)
- Good lighting
- A sluice sink
- Hot and cold water supply
- Racked shelving
- Hanging racks for mops
- Appropriate storage facilities for hazardous substances (and to contain spills)
- Potentially, washing machine plumbing (for cleaning mop heads, depending on the size of the building)

of equipment, and associated storage etc. facilities, may be needed.

- Potentially, charging points for cleaning equipment.

External cleaning (glazing, guttering) or other challenging cleaning operations (e.g. high level cleaning within an atrium) must be addressed in the access and maintenance strategy.

### 2.7.4 Facilities for waste disposal

Waste does not remove itself either. Designs need to provide adequate facilities for waste collection and disposal. Also refer to Chapter 9 for further details.

The standard bins in academic areas (this does not apply to accommodation areas) used across UWE are Leaflet Environmental Envirobin Minis for General Waste (black body, white lid), Paper (black body, blue lid) and Plastic and Cans (black body, red lid). These can be procured by the Waste & Resources Manager in the UWE Sustainability Team and will be charged to your project. Other bins that may be required are food waste caddies, glass bins, confidential waste consoles and battery bins.

Some areas of UWE do have bespoke bin cabinets. These cannot be procured by the Waste & Resources Team and are not recommended due to their lack of consistency and future proofing as they are not modular and therefore do not easily allow for waste streams to be added or removed.

During the design phase the Waste & Resources team will determine the required quantity, location and type of bins required (both internal and external) as well as any other necessary storage facilities (e.g. hazardous waste cupboards).

The strategy may go through various iterations and become progressively more detailed as the design develops until a Waste Procedure is produced as one of a suite of Handover Documents. Specific items of equipment, and associated storage facilities, etc. may be needed.

Waste contractor access to external bin stores must be addressed in the Access and Maintenance Strategy.

## 2.8 Designing for Business Continuity

UWE does not want long down times of assets due to inappropriate product selection or subsequent delays in repairing/replacing them. As a simple example, to reduce costs it may be tempting to purchase a cheaper, end-of-line item of plant. Spare components quickly become increasingly expensive and difficult to source, leading to long periods of down time or potentially a very expensive operation to replace a piece of plant that can no longer be maintained.

Life Cycle Cost analysis may highlight potential risks inherent in design/asset selection. As also discussed elsewhere, UWE has a number of mechanisms for approving derogations and the UWE



Technical Authority (or other staff responsible for Technical Assurance) may challenge designs/selections based on the risks that they present. Design and project risk registers must be used to highlight risks to the resilience of the new structure. There may be requests to hold one or more specific resiliency workshops to identify and resolve issues.

Specific actions to increase resiliency are:

- Within later chapters and the detailed specifications you may see some features that must be used. This may be because they offer certainty of supply or certainty about durability and reliability.
- The life expectancy/reliability of critical plant (i.e. plant and equipment that would render a building unusable if it failed) must not be a victim of value engineering.
- Build redundancy into critical systems (e.g. back up boilers).
- Avoid if possible, single points of failure.
- Manual override systems are generally more resilient than complex solutions.
- Utilities, IT and communication cabling must enter a building at diverse points.
- Avoid products/systems with a single source of supply or long lead times, especially when they are critical assets. If this cannot be avoided then it may be necessary to hold spares.
- If critical assets require highly specialist skills or equipment to maintain, consideration must be given to:
  - Ensuring there is more than one company who can reasonably maintain the asset (in case one ceases trading)
  - Ensuring there is satisfactory 24/7/365 response, including a suitable response time
  - Choosing alternative equipment
  - Upskilling the UWE term contractor to enable them to carry out the task themselves

As discussed elsewhere, designers must think beyond the immediate boundaries of their own design. When recording risks or holding risk/resiliency workshops please consider: What else could be effected if a building or asset fails? What critical services might be delivered from that building that may need to be relocated? Risks may ultimately be escalated to UWE's Operational Risk Registers.

## 2.9 Designing for Climate Resilience

For the University to continue to provide a high quality of service in the long term, UWE needs to design for business continuity within a changing climate. This section not only relates to the long-term broad issues such as climate change, but also the immediate (0-5 year) impacts on maintaining University operations.

Climate resilience/adaptation impacts on all aspects of the design and designers will need to consider:

- Fabric Performance and whole building design
- M&E specification
- Surface water drainage

- Water and Energy security
- Ecosystem services<sup>1</sup>
- Plant replacement strategies
- Whole life costing
- Transport provision
  - Designed to maintain reasonable operation during adverse weather events; and,
  - Designed to minimise local air pollution on campus.

Not all these aspects may be relevant to a particular building or civil project, however they must be reviewed with UWE staff responsible for Technical Assurance to scope-out and prioritise.

The University has introduced new targets addressing Climate Change Adaptation in the UWE Sustainability Plan, which are largely based on the Adaptation section of the AUDE Green Scorecard. In brief, the relevant targets, are:

- **A3 - Flood risk - new projects:** For any new buildings or major refurbishments (projects with a construction value of £2.5m (exc. VAT) or more), at RIBA stage 2, to carry out an assessment of flood risk with an inclusion for climate change, to ensure all major changes to the estate are fully protected for 1 in 100 year events.
- **A5 - Overheating - new projects:** For any new buildings or major refurbishments (projects with a construction value of £2.5m (exc. VAT) or more), at RIBA stage 2, to use future weather tapes, in assessing resilience of new buildings and refurbishments, and ensure buildings are designed to cope with temperatures expected during their first refurbishment cycle (~25yrs). The UWE Design Guide will be the mechanism to ensure this is adopted on all projects.

In all cases, the University are looking for a holistic approach to adapting to a changing climate and expect designers to use the following principles:

1. **Long term - Passive designs:** Designs that work *with*, and *compliment* the environment rather than against it. For example, considering orientation of the building to minimise solar gains, avoiding onerous adaptation to building facades or relying on cooling plant.
2. **Robust designs:** Designing details and finishes that will be robust in adverse weather conditions (storms and gales, flooding, heavy snow etc.)
3. **Flexible designs:** Designs that allow room for additional plant, or adapting to alternative fuels etc.

These principles are not intended to add excessive capital costs onto projects, but rather allow for whole life designs to be considered.

### 2.9.1.1 Assessing flood risk

Designs for new builds must produce a flood risk assessment making an allowance for climate change. Designers must use the Governments guidance "Flood risk assessments: climate change

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<sup>1</sup> Ecosystem services is a broad term representing the ways that the built environment, and building users, can benefit from ecosystems. For example, provision of blue and green landscaping to effect the microclimate from local cooling via evapotranspiration; or the use of tree planting to provide summer solar shading.

allowances” to produce the risk assessment. The Upper, Higher and Central allowances must be used for the time period ‘2050s’ (2040 to 2069) to provide sensitivity analysis. The Guidance also provides parameters to help designers ascertain which scenario must be chosen for a particular type of project. The University sites are in different Flood Zones and therefore the scenario assessment must be considered on a project by project basis.

### **2.9.1.2 Assessing overheating**

As noted in 6.6, passive measures should be exploited as far as possible to reduce or avoid the need for mechanical cooling.

In addition to any requirements under building regulations, projects must demonstrate that they are operable and comfortable under 2030 climatic conditions and, with the addition of defined practical strategies if necessary, under 2050+ conditions. CIBSE TM52 guidance: The Limits of Thermal Comfort: Avoiding Overheating in European Buildings provides further information for designers.

Where dynamic thermal modelling is included in the scope of works, the following CIBSE Design Summer Year (DSY) weather data must be used for assessing overheating risk, based on the UKCIP09 climate change scenarios.

- 2020 conditions      Cardiff 2020s High emissions scenario 90th percentile
- 2050 conditions      Cardiff 2050s Medium emissions scenario 90th percentile

The results of the modelling must be presented to UWE staff responsible for Technical Assurance to inform early design decisions related to orientation, fabric, and building servicing. The purpose is to help the University to assess the risk of design decisions and consider level of future proofing and flexibility in the design that may be required for the future to adapt to the changing climate.

## **2.10 Overview of Asset Management at UWE**

All assets must be logged, and if required barcoded, for management within the University’s CAFM system (Archibus). This system is used for many purposes, but not least to plan all proactive and reactive maintenance activities.

It is essential that projects to construct or refurbish buildings are accompanied by accurate information about new or updated assets. These requirements apply regardless of the size of the project (but are tailored to suit different sizes of project) and are fully detailed within the Project Execution Plan.

It is also important to select and design assets to be cost effective to use and maintain. This is the role of cost-in-use evaluations, and/or Whole Life Cycle Costing. The best design ensures that assets can be maintained and eventually replaced, efficiently and safely.

## 2.11 Cost-in-use

Only a small percentage of overall costs are associated with capital construction expenditure in procuring or refurbishing a building or infrastructure. The remaining costs arise from running, managing, maintaining, and replacing assets. Great care must be taken to ensure that what is provided at handover stage is suitable and fit-for-purpose for its' ongoing life. UWE believes that sustainable buildings and infrastructure will help to minimise operating costs as well as safeguarding the environment and promoting the well-being of staff and students. This is essential to achieve UWE's 2030 net zero carbon strategy.

### 2.11.1 Cost-in-use evaluations on major capital projects

To deliver UWE's commitment, all Major Capital Projects (projects with a construction value of £2.5m (exc. VAT) or more) will fully follow the Life Cycle Cost process below.

#### *2.11.1.1 During the investment planning stage (RIBA Stage 0/1)*

Whole life costing is to be used to provide a high level economic prediction of the project's out-turn costs, to enable UWE to make informed investment decisions regarding whether the project is viable, sustainable and represents best value (this will be part of a wider academic, sustainability and environment assessment). The definition of Life Cycle Cost (LCC) versus Whole Life Cost is best described by quoting ISO 15686 – 5 "Life Cycle Costing covers the initial construction and through-life activities associated with a built asset, whereas Whole Life Costing also includes non-construction activities and income generation such as receiving rent from tenants."

#### *2.11.1.2 During conceptual planning (RIBA Stage 2)*

Life cycle costing is to be used as part of a strategic option appraisal process, to inform the selection of fundamental or cost significant elements, such as structure, envelope, services etc.

#### *2.11.1.3 During the detailed Design Stage (RIBA Stage 3/4)*

LCC is to be used to appraise and select the detailed design options from a life cycle cost and performance perspective and to optimize the LCC plan.

In some circumstances system and equipment selection will be obvious and upon agreement with UWE Estates, detailed and formal evaluation may not be necessary.

However, where two or more options are viable on technical, economic and other grounds LCC evaluation will be required; this must be performed using industry standard models (which are explained below). This must be issued, making recommendations to the PM/ responsible for Technical Assurance, who will give ultimate direction of the best way forward.

### *2.11.1.4 During the tendering process*

To compare a bid's competitiveness and to test the project affordability.

### *2.11.1.5 During the construction and handover stages (RIBA Stage 5/6)*

Set up the LCC in use budgets using an Operational Funding Plan, based on life cycle cost planning using the construction and/or refurbishment costs.

### *2.11.1.6 During the lifetime use of the constructed asset (RIBA Stage 7)*

Benchmarking of actual operational cost as part of the Soft Landings principles. Post Occupancy Evaluations are to be undertaken (after a suitable time interval) to assess the actual building performance against the design performance.

All LCC evaluations are to be shared amongst the design team and UWE in an electronic format to enable all parties to conduct a thorough investigation of the structure of the model.

### *2.11.1.7 Value Engineering*

Value Engineering (VE) is not a cost reduction exercise. The intention is to find alternative and better value solutions to deliver the same or improved outcomes for the end user, rather than undermining functional requirements or performance of a structure in the pursuit of cost savings. **VE must be based upon sound LCC evaluations.** For example; if a plant purchase is likely to save money throughout its life expectancy, but have a substantial impact upon the capital budget then this must be taken into account in any capital decision.

Along with any cost model, an evaluation of the item's performance must be included in order to establish the consequences of any trade off in the purchasing decision.

## **2.11.2 Evaluations on minor capital projects (under £2.5m exc. VAT)**

LCC is to be adopted proportionally to the value and nature of the specific scheme, the parameters to be agreed and recorded at RIBA Stage 1 by the Project Manager. For example, a project based largely on selection and installation of replacement plant may undertake some measure of LCC.

## **2.11.3 Standards**

LCC is to be carried out in accordance with BS ISO 15686-5, using best practice as defined by BSRIA BG 67/2016 'A BSRIA Guide Life Cycle Costing' and the BCIS/BSI publication PD156865

'Standardized Method of Life Cycle Costing for Construction Procurement (SMLCC)': A supplement to BS ISO 15686-5 'Buildings & constructed assets - Service life planning' - Part 5: 'Life cycle costing'.

Selection of the discount rate and the study period will be set in agreement with the university, based upon the bespoke nature of the particular project.

Life cycle lengths must be presented as options within any evaluations to enable UWE to make informed decisions regarding likely future usage profiles. The project team must provide energy performance certificates with the completed building information.

The design life expectancy of the building will be stated in the individual project particulars, however, it must be recognised that University Buildings are often retained far in excess of this notional figure, individual components therefore need to be robust in nature.

## 2.12 Soft Landings

The ultimate goal of any construction project is, obviously, to deliver a functional facility that meets UWE's requirements. To achieve this, UWE needs to work collaboratively with internal and external stakeholders, designers and consultants to determine their functional and technical requirements, objectives and targets, which may go beyond those stipulated in this design guide, and the information, training, support and aftercare that are needed to use/operate the building.

UWE Estates have Soft Landing Requirements which set out what needs to be done and when, to achieve these ambitions. UWE are committed to adopting Soft Landings philosophy on all major new build and refurbishment projects from concept to 18-months post-completion.

### 2.12.1 Information required at handover

UWE project processes set out the information required at handover and also provides templates to enable project teams to identify and track the required documentation. This includes Health and Safety File information (including access and maintenance strategies), Fire Safety Information, and the Operation and Maintenance (O&M) manual.

Information must be supplied in specific electronic format, as explained in Project Execution Plan.

## 2.13 Post Occupancy Evaluation (POE)

UWE has a POE strategy which has been incorporated into the UWE project processes. The Project Manager will, at the outset of the project, determine the precise approach that POE will take.

Projects with a construction value of less than £2.5M (exc. VAT) will take a more focussed or indicative approach to POE, usually as follows:

Stage 1: Contract Sum Analysis

Stage 2: Lessons Learned Report

Stage 3: Consultant / Contractor Performance Review.

These three stages will be carried out in the first six months after handover.

Full Post Occupancy Evaluation (POE) is usually required on any UWE project with a construction value of £2.5m (exc. VAT) or more. This will require a more in-depth investigative and diagnostic approach to the POE process, including all 3 stages as above plus

Stage 4: User Satisfaction Survey (12 months from handover)

Stage 5: Building Performance Evaluation (18 months from handover)

Stage 6: Operational Costs Assessment (18 months from handover)

UWE will work with designers to ensure stakeholders requirements and expectations are clearly articulated and considered. By setting out project objectives, intended benefits and POE requirements at the outset, designers and consultants can allocate sufficient resources to ensure they can contribute meaningfully to a positive POE process.

## 2.14 BIM, Asset Capture, Drawing Standards and the Common Data Environment

UWE has set out its approach to BIM, and its specific information requirements, in "UWE Exchange Information Requirements (EIR)". All new buildings, or future refurbishments of buildings that have been modelled in BIM, must comply with this document.

The objectives of our information requirements are to:

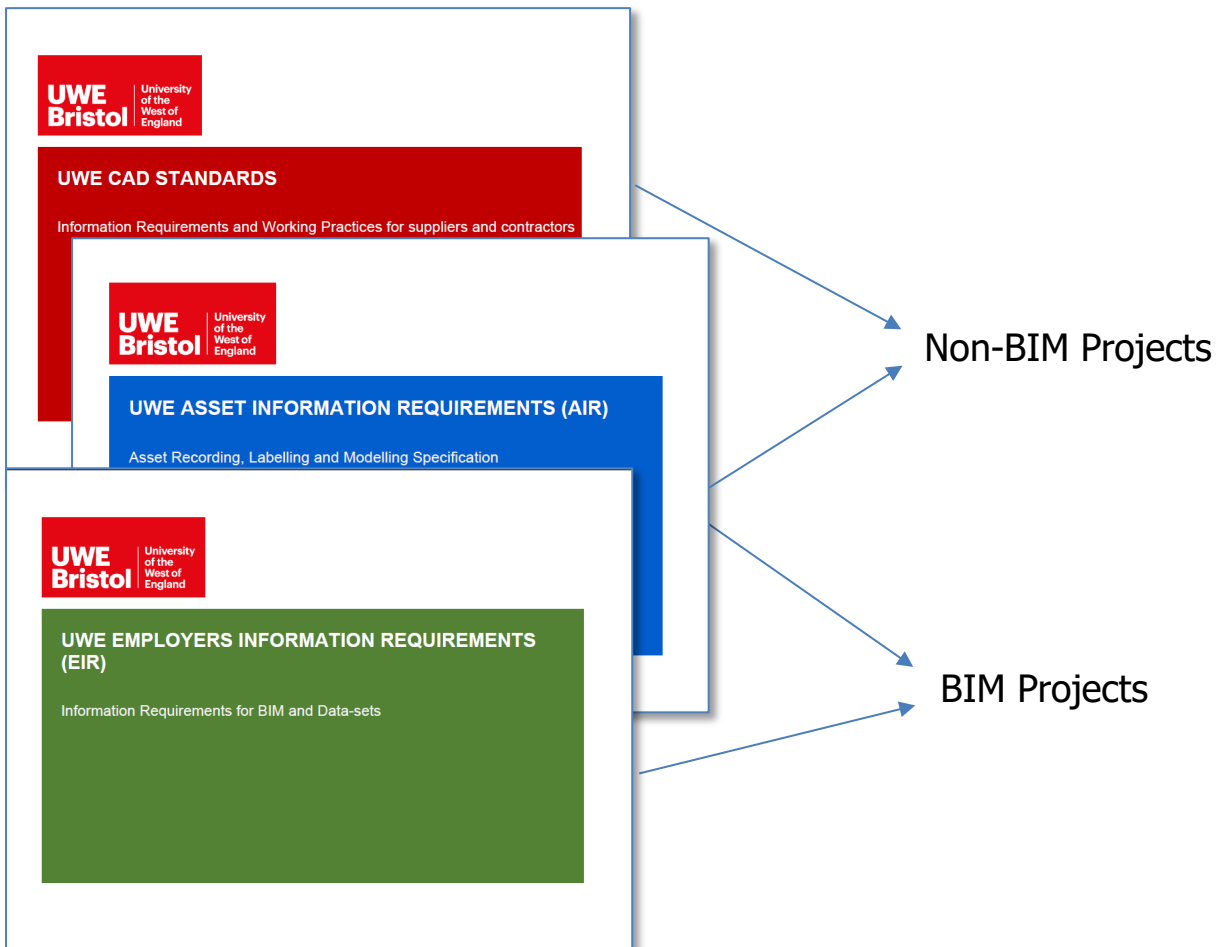
- Maximise production efficiency by adopting a coordinated and consistent approach to working in BIM.
- Define the standards, settings and best practices that ensure delivery of high quality data and uniform drawing output across an entire project.
- Ensure digital BIM files are structured correctly to enable efficient data sharing whilst working in a collaborative environment across multi-disciplinary teams.

To facilitate data exchange and collaboration, UWE may require designers to share information using the Revizto collaboration package.

Even where projects fall outside BIM, the team must still comply with our asset capture procedures "UWE Asset Information Requirements (AIR)", which is included as an appendix. This ensures our assets are appropriately recorded. This underpins our maintenance regime and is vitally important. Without it, we could fail to comply with statutory obligations to maintain assets or assets could fail

leading to disruption and risks. Unless we know what we need to maintain we cannot adequately resource our maintenance operations.

The documents which apply to different types of projects are:





## 2.15 Temporary Works Design

Temporary works are defined in BS 5975 as any solution that (to paraphrase) enables permanent works to be accessed and/or built. It covers everything from excavations to scaffolding, piling mats, propping and site hoarding.

The Health and Safety Executive has also produced their own guidance, SIM 02/2010/04, which complements the British Standard.

For the avoidance of any doubt:

- Temporary works are designed. The designers are therefore bound by this design guide.
- UWE will sometimes provide constraints, specifications and considerations for temporary works designers. A number of these requirements can be found in the UWE Contractor's Safety Pack, specifically:
  - Hoarding and site protection
  - Requirements for temporary footpaths
  - Public protection measures to be incorporated into scaffold design.
- Please note that designers are required to review and consider the UWE Contractor's Safety Pack. It is the responsibility of the designer to ensure the design is structurally sound, depending on location, ground and environmental/weather conditions etc.
- Contract documents, pre-construction information and Employer's requirements may further inform temporary works design
- In line with BS 5975 and SIM 02/2010/04, the Principal Contractor (PC) must have a temporary works co-ordinator who will oversee design and management of temporary works. On smaller projects with simple temporary works, those responsibilities may be discharged by the site manager or another member of the site team. Temporary works co-ordination will never be the responsibility of UWE.
- The PC must set out in their Construction Phase Plan (CPP) how they will manage temporary works. UWE will review those arrangements as part of their duty as client to ensure a CPP is in place and adequately manages significant risks.
- Temporary works must be checked. UWE does not have the capacity to provide a technical check of temporary works design.
- A number of temporary works operations are designated by UWE as high risk activities and requires a contractor to gain approval before commencing (under the approval to work system, explained in the Safety Pack). UWE staff will, at that stage, be involved in reviewing temporary works design. This is for the purposes of establishing that it has met UWE specifications (e.g. whether site plans show that hoarding, signage and/or temporary footpaths will be positioned where agreed). This is not the technical check required by BS 5975 and SIM 02/2010/04.

### 2.15.1 Temporary Road/Footpath/Car Parks (and managing Closures/Diversions)

Proposed closure/diversion of roads/footpaths must be identified during the pre-construction phase (this is part of considering the 'adjacencies' of a project, as discussed in Chapter 1 of this guide). Proposed route and anticipated dates (if known) must be discussed with the UWE transport team. The impact of diversions on emergency vehicles, maintenance operations etc. must be considered.

The proposed route of temporary footpaths must be inspected as early as is reasonably practicable to consider the following and agree actions (which may be included in the contractor's scope of work):

- The adequacy of existing surfaces that might be used and/or the standards required of temporary surfaces that may need to be formed
- The standard/adequacy of lighting
- The numbers of pedestrians using the new footpath
- The interface with vehicular traffic
- Alterations to wayfinding/signage (including responsibility for providing additional signage)

Accessibility of alternative routes must be assessed (we have had examples of wheelchair users diverted via an extremely steep footpath or across gravel that they were unable to navigate). For example, if a temporary crossing point did not have a dropped kerb, a temporary ramp may need to be formed or a dropped kerb may need to be constructed (with tactile paving etc.).

Inconvenience/increased travel distances caused by temporary routes must be minimised as far as is reasonably practicable.

UWE expects [Chapter 8](#) (Traffic Safety Measures & Signs for Road Works and Temporary Situations) to be adhered to as far as reasonably practicable (click 'Chapter 8' to see the guidance). Designers can support compliance by ensuring the considerate location of temporary crossing points etc.

The need for a diversion must be recorded and shown on a site constraints plan.

Diversion or disruption of the public right of way through Frenchay Campus will be subject to close and early scrutiny during the pre-construction phase, and will be the subject of consultation with relevant stakeholders inside and outside UWE. The UWE Transport team will support this process.

### 2.15.2 Disturbance of soft-landscaping

It will sometimes be necessary to create a temporary footpath or road surface over soft landscaping. This must be discussed with the grounds team at the earliest opportunity as they will have to agree the temporary provision and how landscaping will be reinstated afterwards. Refer to Chapter 9.