University of Oxford Estates Services

BUILDING DESIGN PHILOSOPHY

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BUILDING DESIGN PHILOSOPHY DOCUMENT

INTRODUCTION

The Conservation and Buildings Section of University Estates Services is responsible for the repair and maintenance of the building fabric of University buildings, hard landscaped areas, and supporting building infrastructure for the whole of the University's operational estate.

The purpose of this document is to provide guidance to Design Teams and Contractors on the specification and installation of building fabric elements for all buildings; these will be operated and maintained by the University Estates Services.

The principles referred to in this document have been influenced by maintenance and operational requirements, the resources available within the University Estates Services, and also by the need to standardise building elements throughout the 650,000m2 of building stock.

The Building Philosophy Document forms part of the suite of Estates Services Design Philosophy Documents. A full list of the documents is contained within the 'Introduction to the Philosophy Documents.'

The Contractor and Design Team must familiarise themselves with the requirements of the documents, are expected to comply with their contents, and should provide relevant information at each gateway stage.

STANDARDS AND RESPONSIBILITIES

Building fabric choices should take into consideration value for money, here defined as 'the optimum combination of whole life cost and quality (or fitness for purpose to meet the users' requirement).' The Design Team must consider the choice of materials not only within the context of a project but through the life of a building. All parties in the supply chain should provide reliable data on operational costs of products including maintenance.

Oxford University Estates Services is working towards implementing sustainable building practices on all its building projects. Issues which the Design Team will be expected to address include energy efficiency and specification of materials for whole life value, i.e. sourcing through to recycling.

New buildings should be designed to allow easy and safe access for cleaning and routine maintenance regimes including window cleaning, roof maintenance, and gutter and drain clearance.

Materials must be robust and comply with current legislation in supply and installation. All major fabric elements must have an Agreement Certificate or equivalent. Bespoke building elements such as windows made using a non-standard system type which has not been tested will not be acceptable.

Building elements which require specialist annual, monthly, or weekly maintenance, or inspection programmes from day one such as inflatable roofs or oversized doors, should be avoided. Such materials will only be acceptable where given prior approval by the Head of Conservation and Building or where the department agree to pay for the annual maintenance programme for a period of 10 years.

1) Standards

1.1) All building elements, plant, and equipment shall be designed and installed in accordance with the appropriate British Standard or European equivalent, Codes of Practice, relevant Statutory Instruments and Regulations, and University Safety Policy.

1.2) It is the responsibility of the Design/Project Team to ensure compliance with the requirements of this brief.

1.3) The tables in Annex A indicates the division of maintenance responsibilities for the exterior and interior of the buildings between BESC and the Departments. The list is not exhaustive and is intended only as a guide. Designers should check with the University Project Manager if in doubt.

1.4) Nothing contained within this document shall override the requirements of the M&E Design Philosophy Document. Where conflict is noted between this, or any of the other Philosophy Documents, it should be brought to the attention of the Head of Conservation and Buildings.

2) Approval Procedures

2.1) The University approval procedures must be followed by the Design Team. The main areas are briefly outlined below. Any other issues will be outlined to the Design Team by the University Project Manager for the project.

2.2) All Planning Applications are to be submitted to the relevant Planning Authority by University Estates Services. Regular liaison meetings are held between Estates Services and the local planning authority. Design Teams should ensure that there is proper communication with Estates Services throughout the course of the planning process and bring any planning or listed building matters to the attention of the Head of Conservation and Buildings. All meetings with planning officers must be minuted; a copy of the minutes must be circulated to the Director of Asset and Space Management, Head of Capital Projects, and Head of Conservation and Buildings. See planning procedure document for further information.

2.3) No planning applications whatsoever may be submitted without the approval of either the Director of Estates (where it is a minor application) or Buildings and Estates Sub-Committee (for major applications). All requests for approval are to be made through the Head of Conservation and Buildings.

2.4) The University Safety Office is responsible for a range of matters and their advice should be sought during the design process on all relevant issues. Below is a brief outline of their responsibilities in relation to construction projects. More detailed information is available in the Safety Office Requirements document which is part of the suite of Philosophy Documents:

i.) Fire Safety matters: Drawings are to be submitted for approval.

ii.) Laboratory Design: The design and layout of laboratories must be approved by the Safety Office.

iii.) Radiation: The Safety Office should be notified of any issues.

iv.) Asbestos: Further guidance is found in Appendix B.

v.) Project Sign Off: The Safety Office must be involved in the standard handover procedure. Documents outlining this procedure are to be found in Section 5.

2.5) Disability Issues: Drawings and the Disability Statement should be issued to the Disability Access Advisory Panel via the University Estates Services. Guidance Notes are contained in The Disability Access Document which is part of the suite of Philosophy Documents.

2.6) Telephones: Requests for new telephone installations should be made to the University Telecoms Section. See the Telecoms Standards Document for guidance on installations.

2.7) Tender Procedures: All tender returns should be directed to the University Estates Services.

3) General Information

3.1) The University retains information on its building stock; R&M teams should be consulted at an early stage for the refurbishment of existing buildings to ensure that this information is not missed. In particular, the University has undertaken Conservation Management Plans for its listed buildings and these should be reviewed at an early stage.

4) Maintenance Philosophy

4.1) It is a requirement that all buildings and their systems should be designed in such a way that they can be inspected, maintained, repaired, and extended with a minimum of disruption to building users. The Designer should develop a maintenance strategy for the building as early as possible in the design of the project, in order to demonstrate the above objectives are being met. The checklist at the end of this document should be used to demonstrate adherence to the University's Maintenance Philosophy.

4.2) The Design Team should consider the following issues:

i.) Building fabric elements including walls, roof coverings, window types, sanitary installations, floor finishes, etc.

ii.) Information on routine maintenance, e.g. cleaning regimes for floors.

iii.) Access information for maintenance regimes, e.g. access plans for roof clearance and window cleaning

iv.) Asset information, including the expected life of building elements and equipment

v.) Information on insurance backed guarantees for particular products, and data on operational costs for products over the life of the building.

vi.) Asset information will be collected at the end of the project and the Contractor will be required to fill in a spreadsheet with asset and life cycle information. The spreadsheet template is available in the Asset Definitions document.

vii.) The extent and effect on the building users of planned maintenance on the fabric and any plant elements, e.g. how roof replacement would be carried out where there is plant on the roof.

viii.) Information on future use and flexibility of the building, e.g. provision for new plant and equipment.

4.3) In the event of value engineering or requests for changes by the Contractor during the course of a Design and Build Contract, these changes are to be discussed and agreed with the Head of Conservation and Buildings.

4.4) Deviations from the Philosophy Document: The Designer shall provide written information highlighting non-compliance with the principles of the Philosophy Document, together with a justification for the alternative solution proposed.

4.5) Access Control: In order for the University Estates Services to control access to roof areas, all doors to roofs which are not accessed as part of the building's normal usage shall have University Estates Services suited locks fitted.

CONSTRUCTION COMPONENTS AND FINISHES

INTRODUCTION

The choice of construction components and finishes will generally be for the Design Team to determine. There are some instances, however, where particular materials are to be avoided or a specific product, construction approach, or type of product should not be used. There will also be occasions where the University has a strong preference for a product or material for which any mandatory requirement will be highlighted in the following guidance text. In cases of proposals which deviate from this requirement, the Design Team must provide a justification which must be signed off and agreed by the Head of Conservation and Buildings.

When specifying construction components and finishes, the Design Team should understand that the Estates Services are responsible for the ongoing care and maintenance of all University buildings; thus, choices of materials should be justified not just against the building project budget but against all future maintenance costs.

The following sections deal with the choice of building materials on an element-by-element basis. The observations and guidance notes are based on current experience of maintenance for the existing building stock. These notes seek to ensure that repeat problems are avoided.

1) Legislative Issues

1.1) It remains the Design Team's responsibility to ensure that all building work complies with current legislation, and to take into consideration any imminent changes to legislation.

2) Contract Issues

2.1) It remains the Design Team's responsibility to ensure that the design and specification of materials is to current standards and that they comply with the requirements of the terms of their appointment. No information given in this document is to override this responsibility.

4) Specification of Building Elements

4.1) Roofs

i.) Wherever possible, access to roofs should be provided from within the building. Estates Services wish to discourage access to roof areas by ordinary members of staff, unless specifically designed for general use. Accordingly, all roof access doors are to have Estates Services suited locks.

ii.) Any element requiring routine or periodic maintenance shall be easily and safely accessed. Safe Access must be provided to all parts of the roof to allow for routine roof and gutter clearance. Ideally, edge protection or parapets are to be provided to all areas of the roof. Where latchway systems are used as an alternative, the system is to be provided with a test and inspection certificate at handover, with all fixings and appropriate lanyards provided as part of the project. All equipment is to be labelled and stored in a locked storage box on site, close to the roof access point, together with a log book for test and inspection. Harnesses for latchway systems are kept by the Direct Labour Organisation. The Design Team must ensure that any latchway systems are compatible with harnesses owned by the University. Access routes to external mechanical plant or roof top plant rooms must be approved by the Head of Building Services.

4.2) Flat Roofs

i.) Flat roofs should be designed for a minimum life expectancy of 30 years.

ii.) Flat roof membranes: The usual roof covering for flat roof membranes within the University is Sarnafil. Where an alternative flat roof membrane is proposed, this must be approved in advance; additionally, evidence must be provided to show that the proposed roof covering is of equivalent quality. Where Sarnafil is left exposed, it is extremely vulnerable to mechanical damage; if exposed, Sarnafil is not appropriate for roof areas where there will be regular foot traffic. It is also extremely slippery in wet weather and properly designed walkways must be provided to plant areas. Consideration must be given to protection of the membrane in these situations or an alternative finish should be proposed.

iii.) General flat roof finishes: Flat roof finishes such as metal sheet roofs or asphalt will generally be considered acceptable. Proper consideration should be given to ventilation of the underside of metal roof sheets. Installation should be all in accordance with manufacturers' instructions.

iv.) Where flat roofs are specified, the siting of plant directly on the flat roof should be avoided. Plant should be sited in plant rooms. Where plant is sited on the roof, it should be seated on properly designed metal cradle systems which elevate the plant above the surface, and allow for future replacement or repair of the roof covering without the removal of all plant. Such systems should be designed with future alterations or additions to plant in mind.

4.3) Parapets

i.) There have been a number of recent incidents of failures of parapets. These failures have been caused by poor detailing and construction of parapet flashings and copings. This has allowed water to ingress into cavities and track down into the building, causing significant damage. Contractors and consultants should pay careful attention to the design and construction of parapets.

4.4) Gutters and Downpipes

i.) Where possible, valley gutters between pitched roofs should be avoided. Where they do occur, they should be adequately sized for maintenance access. They should also incorporate an emergency overflow pipe, with the discharge sited in a position where it will not cause damage.

ii.) Except for domestic scale projects, UPVC gutters and downpipes are not acceptable.

iii.) In areas where there will be regular vehicular traffic, the bottom section of downpipe should be strong enough to resist impact damage or be provided with appropriate protection.

iv.) External downpipes are preferred to internal downpipes. Any internal downpipe installations should allow for easy and safe access for maintenance. They should not incorporate any horizontal runs and should be detailed to avoid condensation and excessive noise.

v.) Drainage should generally be based on a gravity system. Pumped systems will only be acceptable when agreed with the Head of Conservation and Buildings.

4.5) Windows

i.) The use of non-standard window types which have not been tested will not be permitted.

ii.) The weight and size of glazed units should be properly considered. There have been ongoing problems across the University with windows failing, due to the excessive weight of glass units which are too heavy for the frame.

iii.) Generally, factory-finished window finishes should be specified to minimise on-going maintenance costs.

iv.) Window openings should provide adequate ventilation. Inward opening windows in very deep reveals will provide limited ventilation. This can result in uncomfortable conditions in hot weather in naturally-ventilated buildings.

v.) UPVC windows are not acceptable.

vi.) Careful consideration is to be given to window opening mechanisms. Ideally, these should be secure, easy to operate, and should avoid clashing with likely desk/furniture positions.

vii.) The use of solar control films should be carefully specified to ensure that there is no adverse effect on the glazing, e.g. thermal stress. Internally-applied film is preferred.

4.6) External Doors

i.) Careful consideration should be given to threshold details. Where external doors are level with the exterior, adequate drainage will be required to ensure that there are no problems with water ingress. Slot drains should not be used as these can become quickly clogged-up.

4.7) Internal Doors

i.) Oversized doors should be avoided wherever possible. Such doors have an ongoing maintenance cost from building handover due to the need for regular adjustments. Such doors also present considerable problems for disabled users.

ii.) Consideration should be given to the installation of door finger guards in buildings which might be regularly used by children.

4.8) Flooring

i.) Carpet must not be used in cafeteria or restaurant areas. Installation of carpet creates significant cleaning problems; appropriate floor finishes include vinyl, lino or commercial vinyl finishes, e.g. Karndean or Amtico.

ii.) Unless Plant Rooms are on the lowest storey of a building, they should be tanked and drained to prevent water ingress to lower floors.

iii.) Timber floors must be carefully specified and installed. R&M have had recent experience of timber floors having to be relaid if the original installation was undertaken when the subfloor was still drying out.

iv.) Maintenance and cleaning regimes must be included in the O& M manual.

4.9) Foul Drainage

i.) Foul drainage shall be gravity fed wherever possible. Pumped systems may be permitted only in exceptional circumstances. Pumps should be installed in pairs to allow for servicing and have adequate failure warning provisions.

ii.) Any under floor soil or rainwater drainage should be a robust material, e.g. heavy spun iron.

4.10) Cleaning

i.) Consideration should be given to the provision of cleaner's cupboards and facilities on each floor.

ii.) Materials should be chosen which consider ease of cleaning and robustness.

4.11) Sanitary Fittings

i.) Wherever possible, shower facilities should be provided in every building.

ii.) Shower facilities which are adequate for use by persons with physical disabilities should also be provided.

iii.) The specification of unusual sanitary fittings should be avoided. It can be difficult and time-consuming to obtain spare parts, particularly where they have been sourced from abroad. Designers should remember that items such as toilet seats may need to be replaced a number of times in the life cycle of a bathroom.

iv.) Designers should be mindful of the difficulty of accessing cisterns and general plumbing where concealed systems have been specified. Access panels should be sized to allow removal one person.

v.) Fully concealed systems can also conceal leaks. Designers and Contractors should be particularly careful when designing and installing concealed plumbing systems.

vi.) All kitchen installations which may be used for large-scale catering must have grease traps installed.

vii.) Unisex WCs should be avoided in large buildings.

4.12) Timber

i.) All timber must be FSC certified. This includes timber for carcassing as well as finished timber for doors, etc.

4.13) Pest Control

i.) The Design Team should provide information on how the building will be protected from pest infestation. In particular, they should take steps to ensure that the design does not provide sheltered roosting sites for feral pigeons.

4.14) Avoiding Water Ingress Problems

i.) The use of 'breakout' fire vents should be avoided. Natural ventilation should be provided up through the building to roof top level.

ii.) Basements which continue beyond the perimeter of the building should be avoided.

iii.) Service penetrations into buildings should be carefully designed and installed, particularly where they enter under raised access floors.

4.15) Landscaping

i.) Landscaping around buildings can bring a significant contribution to the quality of the University estate. Much work has been done to develop a palette of materials which should be used on all estate projects.

ii.) No work should be undertaken which will diminish the quality of landscaping around a building, e.g. the replacement of paving with tarmac.

iii.) All soft landscaping design should be approved by the Superintendent of University Parks.

4.16) Signage

i.) All new external signs should be in accordance with the University sign guide. Proposal which deviate from guidance, such as incising the name of the building into the façade, should be signed off by the Project Sponsor Group and supplemented by standard signage as appropriate.

ii.) The design and location of external signs should take wayfinding into consideration. For example, when a site relies on map information to direct visitors to buildings, e.g. Old Road Campus, the project should allow for the cost of updating the maps.

4.17) Asbestos

i.) The Asbestos Risk Register is maintained by the Conservation and Building team. The Risk Register should be consulted before any work is carried out on a University property. It is also the responsibility of the Design Team and Contractor to ensure compliance with the Control of Asbestos Regulations and that any necessary surveys are undertaken prior to starting work. Survey details should be notified to the Conservation and Buildings Team in order to maintain the Asbestos Risk Register.

4.18) O&M Manuals

i.) Specifications that require maintenance by a named Contractor(s) and where the use of another Contractor is stated as negating the guarantee are not acceptable.

ii.) Full specification information must be available to allow for replacement or repair. For example, the colour, type, and manufacturer of glazing units should be sufficient for replacements to match performance and appearance.

BUILDING FABRIC CHECKLIST

EXTERNAL ENVELOPE			
	Material	**Lifecycle**	**Non-standard**
Walls	e.g., Brick	30 years	No
Windows	e.g., Aluminium	25 years	Yes: non-standard large glazed area
Other (please specify), e.g. Louvres	Aluminium Powder Coated	10 years	No

ANNEX A: SPLIT OF REPONSIBILITIES BETWEEN BESC & DEPARTMENT

Table 1: Responsibilities for repairs and maintenance – interior of buildings BESC	**Unit**
The fabric including plastering, wall tiles, and ceilings.	Routine maintenance and cleaning. Decorations.
Fixed floor finishes, stuck down carpet and carpet tiles.	Loose carpets
Doors, windows, door and window furniture, skirtings, panelling, sash cords. Motorised window and louvre actuators.	Locks and fastenings. Security and access control systems.
Glazing to partitions, doors and fanlights.	Glazing to cupboards and fume cupboards. Cleaning of all glazing. Window and skylight blinds.
Fixed seating in lecture rooms and theatres.	Furniture and fittings, display cases, blackboards, whiteboards, bookcases, shelves, laboratory benches, cupboards.
Sanitary fittings, laboratory taps, internal soil and rainwater pipes, drainage channels. Grey water, rainwater harvesting.	Cleaning and unblocking of sanitary fittings, waste pipes and drainage channels.
Hot and cold water installations including point of use water heaters.	Water treatment plant serving departmental equipment.
Central heating installations including electric block storage heaters.	Cleaning of heating pipe floor ducts and all finned and gilled heating emitters.
Natural gas installations.	Compressed air and medical gases installations.
Air conditioning, ventilation and cooling systems (see notes at the end of the table).	Internal cleaning of ventilation ducts. Window fans. Process cooling systems serving departmental equipment. Cold rooms.
Building management systems.	
Steam installations serving only departmental equipment such as autoclaves and sterilizers.	
Fume cupboard extract systems up to commissioning damper. (see notes at the end of the table) Statutory performance inspection and testing (carried out in conjunction with the Safety Office and Insurance section).	Fume cupboards and fittings including control damper. Fume cupboard maintenance, including maintenance and testing of recirculating fume cupboards and microbiological safety cabinets. Maintenance of all other local exhaust ventilation systems and any necessary repairs identified by statutory testing.
All departmental equipment such as autoclaves, sterilizers, refrigerators, freezers, incinerators, kitchen equipment, etc. Safety cabinets and their associated extract systems.	
Cleaning of ventilation grilles within rooms.	
Lifts.	Conveyors, hoists, and lifting gear.
Fixed electrical installations up to and including socket outlets and isolators together with light fittings.	All departmental electrical equipment (including UPS) connected to socket outlets and isolators of the fixed electrical installation. Re-lamping, lighting controls.
End of system life replacements of emergency lighting systems (in consultation with the Safety Office).	Routine testing and maintenance of emergency lighting systems and any necessary repairs, battery replacement or re-lamping identified by that testing and maintenance.
Annual maintenance of fire alarm and detection systems. Planned replacement of such systems	Routine testing of fire alarm and detection systems and any necessary repairs or

at appropriate intervals. (Budget held by Safety Office). Alarm monitoring infrastructure including renewal, replacement and regular maintenance inspection of outstations and nodes.	replacements identified by that testing, or by the annual maintenance.
Portable fire extinguishers, hose reels, fire hydrants, wet and dry risers. Periodic maintenance of sprinkler systems	Fixed fire protection equipment. Weekly testing of sprinkler systems.
Pest control.	
Standby generators serving buildings or parts of buildings as required by regulation or legislation.	Standby generators serving departmental equipment.
Combined heat and power plant, ground source heat pumps. (see notes at the end of the table)	
Notes: The cost of the following items will be recharged to departments: (1) Replacement of faulty or removal of redundant air conditioning units which were installed by occupying unit, replacement of ventilation systems or air conditioning units serving clean rooms, repairs of existing faults discovered at the first service; (2) Maintenance of combined heat and power plant; (3) Any fume cupboard maintenance which is carried out following face velocity testing; (4) Repairs (including re-lamping) to emergency lighting systems that have been identified by routine testing; (5) Repairs or replacements to fire alarms and detection systems that have been identified by routine testing.	

Table 2: Responsibilities for repairs and maintenance – exterior of buildings BESC	**Unit**
Building fabric including roofs, walls, skylights, doors, windows, gutters, etc.	Temporary structures erected by departments, including painting.
External decorations.	Locks and fastenings.
External sunshading, name plates and notice boards.	Flag poles.
Rainwater, soil and other surface water drain pipes. Gutter cleaning.	Oxygen and compressed air pipes on the outside of buildings.
Roads, paths, paving, and steps.	Snow, ice and litter clearing in the immediate vicinity of the building.
Repair of all glazing.	Cleaning of all glazing.
Boundary walls, fences, and gates.	Car park and security barriers or rising bollards.
Cycle stands.	
Substations and switch rooms. LV and HV site distribution network. Lightning protection. Street lighting and external lights attached to buildings.	
Underground heating service ducts and associated distribution pipework.	
Underground communication ducts.	
Pest control.	
Window cleaning gear and roof access systems.	