



Safety Note 42

Health and safety-related design and operational issues for University buildings and construction projects

The following is a list of design and operational issues in buildings where Health and Safety Services are aware that poor specification or design, or changes of use that were not originally envisaged, have led to H&S issues. It has been drawn up in consultation with colleagues in Facilities Management Directorate. Ideally, we would like to see designs for new buildings/refurbishments take account of these concerns. We recognise that the building occupants and others will have their own requirements and views. Where these conflict with the statements below, consultation is required between the project team and all stakeholders to agree solutions.

This is not a comprehensive list and at this stage does not take account of any preferred requirements for e.g. scientific facilities (except where identified in published Safety Guides or Safety Notes (see below)). Nor is it a design specification.

Fire safety

- See **Safety Guide 34 B** (currently in draft, available from H&SS)
- Fire alarm system, critical issues:
 - Prevention of false fire alarms (e.g. smoke from burnt cooking, steam from showers)
 - Deter malicious MCP activations
- Kitchens for students use - safe cooking appliances - kitchen extract automatically activated when cooker in use.
- Sufficient electrical sockets in bedrooms to eliminate use of multiplug adaptors and trailing leads.
- University policy in new builds and major refurbishment projects is to install evacuation lifts and refuges with communication systems – see Safety Guide 34B for more detailed requirements.

Slips and trips

- Flooring must be slip-resistant in the predicted conditions of use. This must take account of spillages (liquids from cooking and washing, drinks spills, wet cleaning etc) and from water ingress on wet footwear. See HSE Information sheet 03/07 *Assessing the slip resistance of flooring*; CIRIA guide C652 *Safer surfaces to walk on*; BRE Information paper BRE IP 10_07 *Safer Floors*
- Stair nosings should not present a trip hazard – see BRE IP 15/03 *Proprietary nosings for non-domestic stairs*.
- There should be adequate protection from the elements, plus effective door matting, to minimise water being taken into the building on footwear.

Children

- It should not be assumed, without checking with the University customer e.g. Residential and Commercial Services for Halls of Residence, that buildings will only be used by

students/staff/adults. Buildings, including Halls, may be used by younger age groups e.g. 11 to 17 years as part of conference activities. Younger children may visit on an ad hoc basis during visits with their parents/siblings etc.

- Taking the above into account, this may impact on the suitability of designs for:
 - Stair guarding
 - Door openings (risk of entrapment/amputations of fingers)
 - Window restrictors to prevent falls (also applies to students)

Cleaning

- Surfaces that require cleaning should be accessible e.g. window ledges, building features, internal and external canopies
- Adequate storage on each floor is required for cleaning materials and equipment, including washing facilities for mops etc.
- There should be facilities for cleaning windows, inside and out, without having to e.g. erect scaffolding or install fall protection systems. For external windows, there is a preference for reach and wash systems where it is practicable to use these from the ground floor. If the exterior of windows are to be cleaned from inside the building (e.g. tilt mechanisms) there must be a robust and effective window restrictor system that cannot be tampered with.
- Adequate number of power points to avoid trailing leads while cleaning.

Maintenance

- Services/plant rooms and equipment within it must be accessible for e.g. workers carrying tools, accessing panels etc.
- If there is a roof plant room, the lift in the building should go to the roof level (possibly with controls to prevent unauthorised persons accessing the roof area).
- No spiral stairs for routine access or egress.
- No vertical ladders for access/egress, including emergency egress.
- Designs should eliminate confined spaces, low ceiling heights, excessive noise etc.
- Audible fire alarms in plant rooms/maintenance areas, supplemented by beacons or other alerting devices if necessary – see Safety Guide 34B (draft).
- Light fittings that are accessible for changing bulbs etc, especially in rooms/areas/atriums with high ceilings.
- All services ducts must have panels that can be secured to prevent unauthorised access.
- Substations must be secure to prevent unauthorised access.
- Any equipment/services that may need to be maintained on a regular basis, or which would need to be repaired quickly in the event of a breakdown, should be in an area protected from the weather (rain, snow, high winds etc) so that maintenance staff can effect repairs in safe, dry conditions.
- Evacuation lifts require a motor room for emergency power supplies, switch gear etc. This must not be shared with other users e.g. cleaners. Exact location to be agreed with the lift consultant and design team.
- All electrical systems to be compliant with the IEE 17th edition Regulations.

Work at height – roof and gutter access

- Roof top safety - tripping hazards must be minimised.
- Systems for cleaning valley gutters, edge gutters etc should minimise risk of falls.
- Roofs where access/maintenance is required – must be guarded in preference to e.g. fall arrest or mansafe systems.
- No fragile roof lights or roofing systems through which people or tools could fall.

Falls from height – members of the public/students

- Depending on the type of building and location, but in particular in Halls of Residence, there should be no balconies.

Student kitchens

- Sufficient cookers and fridge facilities in student kitchens (1 of each between 5 persons).
- Space in kitchens for 3 recycling bins.

Waste bins

- External bins stores to be located at least 10m away from the building.
- Adequate space for accessing bins and for removal lorries.

Transport

- Transport – adequate space for parking and deliveries (including turning circles for vehicles) in proximity to the building to reduce manual handling risks during deliveries of supplies e.g. food and catering deliveries, conference food etc.
- Adequate number of cycle shelters to be provided, with weather protection and means of securing cycles ('Sheffield stands' design preferred).
- Any access ramps provided for disabled people should not be used as parking stands for cycles – hence the need for adequate 'official' cycle shelters.

Toilets

- Adequate space for toilet cubicles equipped with sanitary bins.
- Bathroom/toilet facilities will depend on the mix of ensuite and non-ensuite. Preference for non-ensuite facilities to have access to a separate toilet and wash hand basin, not located within the bathroom.

Glazing safety

- Glazing in critical areas should not break in a way that would lead to: a risk from broken glass; a person falling through; leaving the building insecure. (Possible causes of breakage include flying stones from grass cutting; impact from cleaners equipment; student misbehaviour).

Catering safety

- Catering facilities must comply with the legislative requirements of EC Regulation No 852/2004, Annex 2.
- The design should allow for easy cleaning of all areas. The walls in preference should be of a smooth easy-to-clean material in preference to tiles, which are more difficult to clean and require more maintenance.
- Washbasins should be knee operated, so that there is a reduced risk of cross contamination compared to using taps.
- Ventilation should be adequate, but not be too noisy, and allow for regular cleaning without the need to climb on to working areas to access.
- Grease traps should be included as a preference (Thames Water may now insist). This would help prevent blockages of the sewers on campus. Need to ensure that they are maintained regularly so that they work properly, hence easy access required.
- Pest Control – A well designed, managed and maintained building should not have problems with pests. Ensuring good waste disposal arrangements and preventing access to pests along with regular checks should be adequate to prevent pest invasions.

Housing Health and Safety Rating System

The Housing Health and Safety Rating System (formerly published by ODPM) will apply to Halls of Residence. This has more guidance on facilities required.

Additional Information – University of Reading Safety Guides and Safety Notes

Health and Safety Services publish a number of Safety Guides which set out operational policies, procedures and standards for the University. Some of these guides have statements which may impact on the design of facilities and buildings. See the list below for a summary. The Safety Guides are official University policy which must be adopted. Safety Notes provide additional information and good practice, but have not been approved by the University's Health and Safety Committee. They are available on the Health and Safety Services pages of the University's web site. If contractors/designers are unable to access these, please contact either Health and Safety Services (safety@reading.ac.uk) or your contact in the University of Reading Projects, Design and Feasibility team.

- Safety Guide 11 *Electrical Equipment* – has limited information on design issues for certain types of facility e.g. electrical engineering labs. Note this Guide is being rewritten and the revised version will be published in autumn 2008.
- Safety Guide 29 *Food safety and hygiene* – has up-to-date generic info on facilities/requirements for food areas.
- Safety Guide 34 B (currently at final draft stage) *Fire safety design guide*. Not on web site, will be published autumn 2008. Available in draft from Health & Safety Services. Essential for designers to adopt the standards set out in this guide.
- Safety Guide 21 *Safe Use of Lasers* – new version being published (not on web site yet), which has very limited info on requirements for laser labs.
- Safety Guide 24 *Dangerous Substances and Explosive Atmospheres Regulations 2002 (DSEAR) Including Flammable Liquids*. Includes design information for flammable stores.
- Safety Guide 35 *Work at Height*. Has limited information on loading bays, edge protection etc.
- Safety Note 20 *Fire Refuge areas* – has some info on what they are and what they should be used for.
- Safety Note 31 *Recommended / required facilities for microbiological containment laboratories*. Has detailed information on design requirements, based on HSE guidance.
- Safety Note 35 *Recommended / required facilities for laboratories used with open sources of radioactive material*. Has detailed information on design requirements, based on Environment Agency requirements.
- *Control of Legionella Bacteria within water systems: Legionella Policy and Procedures*. Has detailed guidance on the design of water systems.

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