



The importance of building design and proofing in the management of rodent and insect pests in food premises

A guide produced by Acheta, the specialist pest management consultancy

www.acheta.co.uk

Fundamental objective

The layout, design and construction of food premises is critical to food safety. This includes protection against contamination and the management of pest populations. *It **must be** a fundamental objective of any building design and construction project to prevent pests from entering buildings, and to minimise the opportunities for those which do enter, from establishing and multiplying within.*

Architects and building designers must consider pest minimisation and management when designing new projects, or redeveloping existing structures. Design and layout must be such as to minimise potential points for pest ingress and harbourage, and optimise access for cleaning, pest monitoring and control. Special attention should be paid to the following;

- Drainage systems, which should be constructed using rodent proof materials.
- The potential for pest movement into and through the building, via floors, walls and ceilings. This can be minimised through good design. Service routes (gas, electric, gas and water) must be effectively sealed where they pass through the building fabric.
- The use of false ceilings, wall voids and cavities etc should be avoided wherever possible. Where these are unavoidable, quick and easy access must be designed in to allow for pest monitoring.
- Waste handling plant and areas must be designed, located and constructed such that they do not attract pests, and do not allow them the opportunity to establish close to the building, or to enter via points where such plant connects to the building.
- External structures should be designed and constructed to avoid attracting, and offering harbourage to, pests.
- Landscaping works must not encourage pest activity, offer harbourage opportunities, or restrict pest control works.

The Principles of Integrated Pest Management

Exclusion

- Methods adopted in preventing pest entry into a building or site. These include landscaping, design, construction and maintenance that will discourage pests, making entrance difficult.

Restriction

- If pests do get in, then high standards of proofing and hygiene, and restricting access to food, water and harbourage, will make them easier to control, and prevent them dispersing into other areas. Restriction reduces the ability of a pest to harbour, to breed, and to spread.

Destruction

- Pest control (destruction) methods are used to reduce or eradicate the infestation if pests have gained access, established and started to disperse.

Some definitions

Common pests:

- Rodents; brown and black rats and house mice
- Insects; flies, cockroaches, ants, beetles and moths
- Birds; feral pigeons, sparrows, starlings and gulls

Harbourage area:

- Internal and external areas where pests can live, breed and hide, for example undisturbed areas, internal wall and ceiling cavities, old construction materials, undergrowth and redundant machinery.

Proofing:

- Any potential access points for pests that are identified (e.g. gaps around pipe-work or under external doors, holes in external brickwork, broken drains, damaged / tied back strip curtains etc.) must be adequately sealed (proofed) to reduce the risk of pest access, and to deny them harbourage.

Good practice during demolition, construction and refurbishment programmes

It is important that pest minimisation measures are adopted during demolition, the construction of new premises, and the refurbishment of existing premises.

- Redundant drainage and sewer systems must be grubbed out or permanently capped.
- Live drainage and sewer systems must be appropriately sealed and capped whilst construction works are in progress.
- A rodent monitoring and control programme should be in place during the programme of works.
- The site should be kept clean and tidy, with debris likely to afford rodents cover and harbourage kept to a minimum.
- Staff office and welfare facilities should be designed, constructed and maintained such that pest activity is not encouraged.
- Voids and cavities within the building fabric should be kept clean and clear of general waste material as construction proceeds.

Rodent proofing; some general principles



The incisor teeth of rodents grow throughout the life of the animal. Rodents gnaw on both food and non-food materials, preferring rough surfaces and edges for the purchase that these offer. They have difficulty gnawing on flat, hard surfaces.

Gaps larger than 6mm for rats, and 5mm for mice may be exploited for entry to buildings, and small openings may be enlarged by gnawing.

Materials recommended for proofing against rodents include:

- Concrete: minimum thickness of 6cm for reinforced, 9cm for non-reinforced.
- Galvanised or sheet metal: 24 gauge (0.56 mm) is recommended for pest proofing purposes as it is easy to cut and bend. Perforated sheet metal grilles should be 14 gauge (2mm) or heavier. Galvanised or stainless steel are preferred as rodents may penetrate aluminium.
- Brick: 9cm thick with mortar-filled joints.
- Wire-mesh: 19 gauge (1 mm) thickness, with 6 mm mesh size to exclude rats, and 24 gauge (0.56 mm) thickness, with 5 mm mesh size to exclude mice.

Other materials commonly employed for proofing against pests include;

- Caulks and sealants: A caulk is a non-elastomeric compound, which will not return to its original size and shape following stretching or compression. They are suitable for filling small holes and gaps, of less than 6 mm, and where little or no movement is expected. Sealants are elastomeric compounds suitable for filling joints where movement (typically 25-50%) is anticipated. Both are an effective means of proofing against pests when used correctly. The following factors will need to be considered when making the product selection:
 - Is movement expected at the joint, particularly with regard to differential expansion when sealing gaps between different materials, or where vibration is likely (perhaps around plant footings) or vehicles (expansion joints in warehouse floors)?
 - Is the material compatible with the surfaces of the gap to be sealed? Wet, frozen, deteriorated or oiled surfaces are notoriously difficult to seal.
 - Is the product suitable for the environmental conditions (weather/ UV light, temperature etc) it is to be exposed to?
 - Is the product of appropriate visual appearance, and/or safe to use in food handling areas? Clear or white sealants are often unacceptable in food manufacturing environments.
 - Is the product likely to be breached by rodents? Proprietary products such as Mouse-stop are specifically designed for use against rodents. They are typically non-toxic, hard setting pastes that are waterproof and able to be painted over. They are suitable for proofing smaller gaps against rodent ingress.

- Expanding (urethane) foam: This is of low flexibility but, unlike caulks, can be used to fill much larger gaps. It can be difficult to apply in a visually appealing way, and is very susceptible to degradation by UV light. *The biggest drawback of expanding foam from a pest proofing viewpoint is that it is easily penetrated by rodents (as in the photo, left) and, when used for such purposes, should be considered a temporary solution, ideally to be used in combination with wire mesh of some description. It does have the advantage that the chewed foam pieces usually provide a clear indicator of the presence of rodents.*



- Cement mortar: An effective means of sealing gaps and holes against rodents where no vibration or building movement is expected. Rodents can penetrate mortar, particularly before it has hardened fully. This can be prevented if used in combination with steel wool. This also protects the steel wool against environmental degradation (see next point).
- Copper and steel wool: Both are an effective means of plugging small gaps and holes against rodent entry or movement, with copper mesh to be used where high humidity or exposure to water would cause steel wool to rust.
- Wood: very attractive to rodents and **NOT** suitable for proofing against rodent entry.
- Bristle or brush strips, and rubber sweep seals: Used for sealing gaps at the base of pedestrian and goods doors against rodent entry (and the tops of doors against bird entry). These products


come in a range of bristle lengths, and with straight or angled aluminium carrier strips. They form a deterrent to rodent entry, but it is not uncommon for rodents to chew through the bristles or rubber strip. Reducing door gaps to <5mm should be the objective when fitting such seals, and special attention is needed to effect a thorough seal across the entire width of the door.



- Rubber compression strips: Often used to seal the base of roller doors, these can form an effective barrier to rodent entry. However, the ends of the strip often do not seal fully to the door frame, and even a very small gap may quickly be enlarged by gnawing.
- Metal collars and balloon guards: Collars are used to prevent rats climbing up the outside of pipes, and balloon guards to prevent rats from emerging at high-level having climbed up the inside of sewer ventilation pipes. Both must be of metal construction, and installed in such a way that rats cannot bypass them.
- Low friction materials: High gloss paint is the best such example, with a 150mm wide band, painted at least 600mm above the ground, being an effective barrier to rodents climbing rendered walls. Brick walls would need the paint to be applied onto a horizontal strip of rendered wall for this to be effective.



Several specialist proofing materials, specifically targeted at excluding rodents, are also available:

- Xcluder mesh; available as a roll, it can be cut and fitted to basically any shape e.g. conduits, cables, holes, pipe-work etc. It provides a more robust alternative to wire wool, with the added poly fibres allowing the product to 'spring' back once installed in a crack or crevice.
- Xcluder door sweeps are a more robust alternative to bristle strip for proofing the base of doors. The flexible strip is filled with Xcluder mesh, and provides a versatile, flexible and anti-gnaw substitute.
- For conduit and cables Rodent Brush is another option. Proofing around cables is often problematic, with gaps often sealed with unsuitable materials such as expanding foam. This adaptable brush strip can be fitted to shape. The brush fronds are said to discourage gnawing rodents due to 'whisker interference'.

External areas



Landscaping	
<ul style="list-style-type: none"> • Plants known to have a history of pest problems should be avoided. These include: <ul style="list-style-type: none"> ○ Berberis spp.; numerous thorns collect litter, and the spines can make treatment dangerous ○ Cotoneaster spp.; flowers encourage queen wasps ○ Salix spp.; prone to aphids, which then attract wasps • Planting should not be too dense, and the ground underneath should be mulched with bark, gravel or shingle. • Plants which shed few or no seeds and fruits are preferred, as these will be less attractive to rodents. • Where rodent activity is known to be a problem, weld-mesh can be used to cover the planting area, with planting done through holes cut in this. • Fallen leaves can provide cover for rodents, so will need to be cleared regularly. Hence evergreen trees and shrubs are preferable. • Overhanging branches can provide access to buildings for rats and squirrels. • Vegetation should not encroach anywhere within 2 metres (ideally 5 metres) of any building. • A clear boundary, and good hygiene standards, should be maintained around waste handling and recycling areas • Where banking exists around a site it should be kept free of dense vegetation, to allow for easy clearing of litter. • Ornamental ponds should be avoided, and opportunities for water to pool accidentally should be minimised. • Pathways against the building should be sloped to allow rainwater to run-off. Concrete is preferred to slabs or gravel as it offers fewer opportunities for penetration by rodents. 	
What good looks like	What bad looks like
 <p data-bbox="185 2002 699 2027">No vegetation encroaching on the building</p>	 <p data-bbox="783 1962 1409 2027">Vegetation densely planted and planted tight to the building</p>

Fencelines	
<p>Where rat infestation is a recurring or chronic problem on adjoining land, 'rat-proof fences' can sometimes form an effective barrier to rodent movement, <i>though rats are intelligent animals and may find a way around these.</i></p>	
What good looks like	What bad looks like
 <p>The barrier is of a good height and seals fully to the ground, ideally being lapped outwards at the base. The presence of scrap metal materials is obviously not so good, and the barrier is also compromised by the vegetation on the adjoining land, and the gate at the end of the fence!</p>	 <p>Barrier is not high enough, though it may reduce immediate access opportunities</p>

Goods yards and general external storage	
<ul style="list-style-type: none"> • Yard areas should be maintained in a clean, tidy condition. • All walls and areas close to plant rooms, compactors, plant rooms and temporary stores should be accessible for inspection. • Goods should never be stored on soft ground 	
What good looks like	What bad looks like
 <p>Clean yard area with pallets stored neatly and well away from the building, or stacked neatly with clear access to the external walls.</p>	 <p>Storage untidy and preventing inspection.</p>

	 <p>Poorly stacked pallets spilling onto soft ground.</p>  <p>Large quantities of baskets awaiting washing and re-use. Inspection of this bulk stack is impossible.</p>
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<p>Canopies</p>	
<ul style="list-style-type: none"> • These should offer minimal opportunities for bird perching or roosting, or entry to the main building via gaps in the fabrication where they tie into the walls • Internal side ledges, support beams and overhead cross beams should be eliminated if possible. If present, products are available to fit to wall-ledges such that these are angled at 45° to prevent perching, roosting and nesting. • Goods should not be stored under canopies for prolonged periods, particularly if they are then brought into stores, as this offers significant potential for pest ingress and contamination. 	

<p>What good looks like</p>  <p>Netted cross members under canopy</p>	<p>What bad looks like</p>  <p>Canopy with cross-members ideal for pigeon perching</p>
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Seals around building joints



Wall ledges fitted with bird spikes



Canopy kept clear



Roof overhang netted off to prevent birds nesting on the roof purlins



Gaps large enough for sparrows to exploit where supports tie into building




Internal structure un-protected against bird perching







Goods stored under canopy





Gap between wall and roof colonised by sparrows





Electrical intake pits and gullies	
<p>A hard stand should ideally be created around any electrical intakes and transformers, as the stones and gravel that are often used can be exploited for burrowing by rodents. Wall foundations must be taken down to a solid bottom at least 900mm below ground level, and concrete laid between the walls to prevent rodents burrowing into the building.</p>	
What good looks like	What bad looks like
	 <p>Unsealed cable runs</p>

Pipe and cable runs and entry points	
<ul style="list-style-type: none"> • Where pipes and cables enter external walls, any gaps should be sealed with a solid plate to prevent rodent ingress via these routes. • Small gaps (<5mm) should be sealed with a flexible mastic • Any empty/redundant trunking or ducting must be removed, sealed or capped. 	
What good looks like	What bad looks like
 <p>A permanent seal around pipe or cable entry points.</p>	 <p>Damaged and inadequate proofing around cables passing into an electrical intake</p>  <p>Unproofed cable run</p>

Pedestrian doors and windows	
<ul style="list-style-type: none"> • Pedestrian doors and windows to the outside, which are opened on even an infrequent basis, should be suitably proofed with fly-screen mesh 	
What good looks like	What bad looks like
 <p>Window fitted with a fly-screen</p>	

Louvre doors and panels	
<ul style="list-style-type: none"> • Louvred external doors should be fitted with pest proof mesh of less than 5 mm, on the inside face of the door, to prevent rodent ingress. Note; this may affect air flow, and so cause overheating of plant – engineering input may be necessary. • The base of plant room doors should be adequately proofed with bristle strips. 	
What good looks like	What bad looks like
 <p>Louvre doors proofed with wire mesh on the inside face of the door, and bristle strips on the base</p>	 <p>Louvre doors with extensively damaged mesh, and daylight visible in the central gap of the bristle strip</p>

Voids under buildings
<ul style="list-style-type: none"> • Voids may be a design feature, or may be caused by, for example, building subsidence. They should be avoided wherever possible • External walls should be built of solid brick or well-sealed cladding. Ideally, no voids should be left in the structure of the external wall. • Wall foundations must be taken down to a solid bottom at least 900mm below ground level and concrete laid to prevent rodents burrowing under or into the building. • The addition of a concrete curtain wall to a depth of 600mm will protect the foundations against rodent ingress.

What good looks like	What bad looks like
  <p data-bbox="170 1234 713 1296">Solid concrete base with cladding embedded into, or close fitting to, the concrete.</p>	 <p data-bbox="815 719 1414 786">Wall-floor junction gap opening up due to building subsidence</p>  <p data-bbox="884 1245 1342 1279">Brickwork cracks caused by subsidence</p>

Waste handling areas	
<ul style="list-style-type: none"> When wall cavities are breached to install plant associated with waste compaction or baling they must be adequately sealed internally, externally and to any wall cavity, using a material that will both prevent rodent ingress and allow for movement of the waste unit during use, collection and delivery. There should be no external gaps into any compactor mechanism or chute. Allowance should be made for adequate cleaning during change-overs. 	
What good looks like	What bad looks like



Compactor chute, well sealed to the outside of the building



Inadequate seal between compactor chute and cavity wall



Area around compactor kept clean and tidy



Poor hygiene standard around the compactor

General external construction; gaps and airbricks in the building fabric

- Airbricks and weep-holes supply ventilation to wall cavities but may allow mice and insect pests to gain access. They should be protected with steel/plastic vents or wire mesh as appropriate.

What good looks like



Good pointing work on an older wall

What bad looks like



Pointing excavated by mice



Door frame in good condition



Steel plated door with brush strip fitted



Weep (ventilation) hole proofed with ventilated plastic plugs



Airbrick fitted with wire mesh cover



Rotten wooden door frame



Rotten base to wooden door



Weep (ventilation) holes with smears, where mice are using them to access the wall cavity



Unproofed airbrick; holes are large enough for mice to enter

General external construction; weak spots on walls

- Base of wall should be well sealed to the ground.
- Where rodents are able to climb the external wall, a band of “non-friction” material can be applied 1 metre above ground level.

What good looks like



Solid concrete joint between wall base and floor

What bad looks like



Rat climbing between wall and downpipe



Poor finish to base of wall



Mouse excavation of wall base; wall cavity has probably been accessed

General external construction; gaps beneath the rain-sill of wall cladding panels

- Proofing underneath external sills should ensure there is no gap at the wall and cladding joint. Pre-formed corrugated cladding is difficult to seal adequately against pests. Pests frequently enter at the point where cladding meets conventional walling.

- Where rain sills are above low-level brick or blockwork walls, and gaps may exist, the ideal would be to encase the base of the wall in concrete, sloped such that rain runs off.

What good looks like



Well-sealed rain-sill



External cladding panels embedded in concrete; *this should be sloped to shed water*

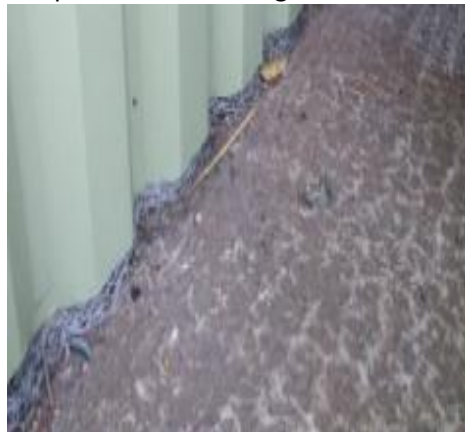


Joint between cladding panels and wall being sealed

What bad looks like



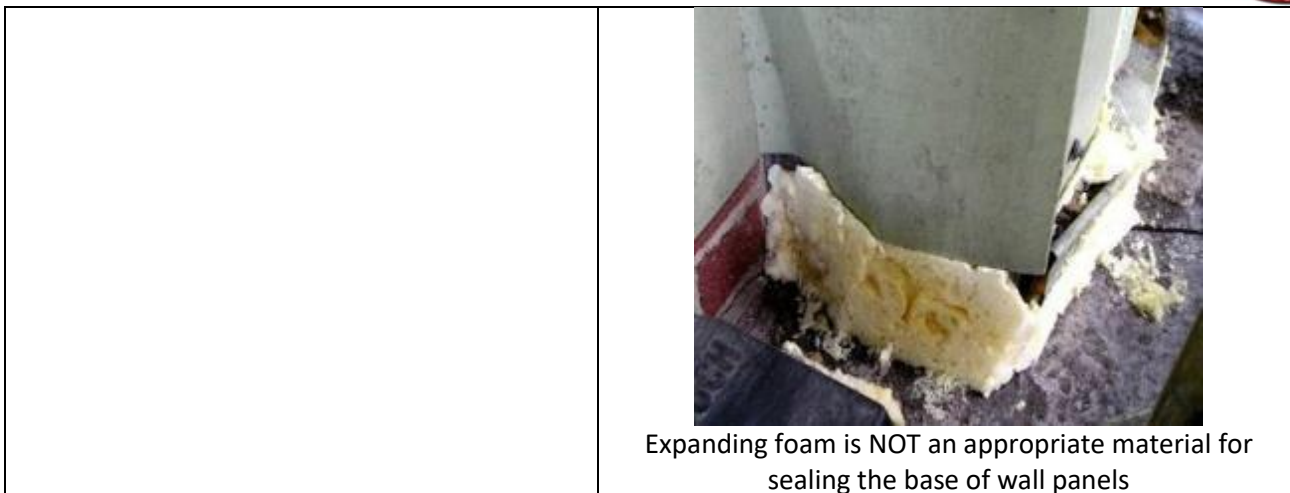
Gap between cladding and brick wall



Crushed mesh used to seal base of wall panels; unlikely to be fully effective



Mesh proofing around base of cladding panels; expensive and unlikely to be effective



External drainage

- Suitable pest proofed drainage systems should be used. For example, earthenware below ground drainage in preference to plastic systems, which can be more vulnerable to rat damage from gnawing if not properly installed.
- Rodent proof drainage systems should be adopted on all new build / refurbishment projects to prevent rat egress from the sewers to the building structure, for example incorporating earthenware rat barrier drainage fitments as appropriate.

What good looks like



Storm-water drains are less prone to rat problems, but proofing further reduces the risk



Wire balloons prevent rat emergence from sewer vent pipes. Plastic balloons are less effective as rats can chew through them

What bad looks like



A rat nest in the sewer system



A purpose-designed rat blocker device being fitted into the sewer system



Rat emergence hole around manhole



Rat damage to plastic foul-water drainage pipework

Internal areas

Expansion joints

- Floor expansion joints should be well sealed and consist of a material that allows for movement.
- Where necessary a triangular fillet of mortar should be used to cover any expansion joint around the wall-floor junctions, as this will both seal the joint and facilitate cleaning.
- Expansion joints that run through the centre of racking in warehouses are often over-looked, but frequently provide rodents with a route of entry from building foundations and sub-floor voids. They should be scraped clean and filled with a flexible mastic.
- A 0.5 m white-painted strip around the wall-floor junctions of warehouse areas highlights evidence of pest presence and inadequate cleaning.

What good looks like



Installing a triangular fillet of cement around the wall-floor junction

What bad looks like





Effective expansion joint seal in a central area.

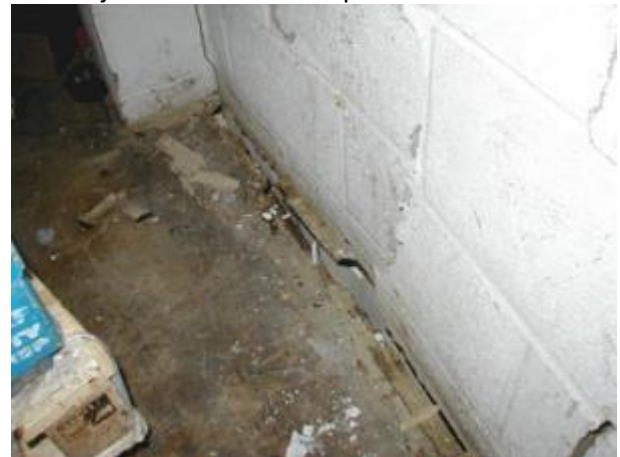


Chilled warehouse with protection barriers and wall-floor junction which cannot be penetrated by rodents

Fibreboard infill excavated by mice from a wall-floor junction expansion joint



Excessive use of expanding foam to seal a wall-floor junction. Mice have penetrated this



Blockwork wall has been pushed out by a fork-truck, and mice have colonised the sub-floor area

Internal walls

- Internal walls should ideally be of solid construction from ceiling to floor.
- Where cavities are unavoidable then, to prevent pests gaining access to them, the wall should be capped with cavity closers.
- Where damage from goods movements may occur, suitable protective barriers should be installed.
- Ceramic tiling should be installed with grouting filling all gaps

What good looks like



Solid wall from floor to ceiling

What bad looks like



Hollow box sections along the wall-floor junction



Cavity wall sealed at the top, sides and bottom, no ingress points for pests.



Wall protection barrier



Internal wall protected by well fitted chequer plate



Blockwork wall exposed



Ceramic tiling with grouting gaps along the base and top of the upstand tiles

General internal construction; gaps around cables and pipes

- Any pipes or cables should be tightly sealed where they pass through walls, ceilings and floors as rodents may move into adjacent areas via gaps around these.

What good looks like

What bad looks like



Gaps well sealed with concrete



Well-sealed pipe passing into floor



Sealed pipes passing through wall



Ceiling hole sealed with wire mesh



Mouse smeared hole where a pipe has been removed and hole has not been filled



Cables passing through a section of fire retardant insulation; proofing non-existent



Small gap under soil pipe



Gaps around services passing into false ceiling

Pedestrian and goods doors opening to the outside

- External doors must be close-fitting and adequately proofed (using sealing strips where necessary) to prevent access by pests.
- No gap should exceed 6mm.
- Internal structure of rapid roll door reveals should seal tightly to the ground.
- Where possible, an 'airlock' should be created, with inner and outer doors to reduce the potential for pest access.

What good looks like



Close fitting door; no additional seal required



Bristle strip fitted to effect a tight seal



Roller door compression seal fitting tightly to floor and doorframe

What bad looks like



Mouse damaged bristle strip



Carrier on brush strip is damaged and not been adequately crimped; bristles have fallen out



Gap under door with no bristle strip fitted



Base of redundant concertina door embedded in concrete (a triangular fillet of cement would also serve, and can be easily removed if needed)



Gap at base of rapid roll door reveal



A 'ventilated' roller door allows airflow but denies entry to flying insects and birds



An airlock, with inner and outer rapid roll doors. It would, of course, be better if at least one of these was kept closed at all times!

False and suspended ceilings

- False ceilings are commonly exploited by rodents and should be avoided wherever possible.
- Where they are present they should be accessible for pest monitoring and control.
- Suspended ceilings with fixed (or very difficult to lift) tiles may be accessed for monitoring purposes by installing access panels, or proprietary monitoring products such as Bait-Safes.

What good looks like



Ceiling tile which can be easily lifted to allow for monitoring and inspection



A Bait-Safe; purpose designed rodent monitoring point designed for false ceilings

What bad looks like



Heavily mouse smeared light fitting in false ceiling

Scissor lifts and dock levellers

- Dock levellers may provide harbourage and a route of entry to rodents.
- Cladding panels or framed 6mm gauge mesh may be used to seal the entrances to the leveller void, though this can create a trap for rubbish to collect.
- New dock levellers should be installed with an integral sealing strip
- Retro-proofing of the dock leveller itself is very difficult, but can be done with certain designs of leveller using either bristle strips or rubber compression strips. However, these are often easily damaged and create hygiene problems of their own.
- No voids should be left open to the side of scissor lifts and dock levellers.
- All such voids should be on a regular cleaning schedule.
- Internal voids under dock levellers can be permanently monitored for rodent activity.

What good looks like

What bad looks like



Proofing of a dock leveller with bristle strip



No gaps or voids in external walls or cladding around scissor lifts or dock levellers



Gaps and voids in external walls provide harbourage areas for pest



Gaps under dock levellers (tail lift slot) provide harbourage areas for pests and are a litter trap

Building fabric; Internal wall ledges

- Mice very frequently exploit wall cavities as both a harbourage and route of entry into the building. They are often the first location where they appear.
- All internal wall ledges **MUST** be monitored for rodent activity.
- All exposed cavities must be suitably proofed, ideally using metal plate.
- Particular attention must be paid to corners and areas around RSJs. All plate should be fitted such that no gap larger than 3mm remains, and any small gaps should be sealed with a sealant.

What good looks like



Metal plate used to proof top of block-work cavity wall, with small gaps to RSJ sealed with silicone

What bad looks like



Rodent damage to cabling on a warehouse wall ledge



Gaps between external cladding and top of wall ledge.



Foam 'proofing' between cladding and supporting metalwork, but leaving the wall cavity still open (arrowed)

Superfluous building materials

- All building and construction materials/rubble must be removed from site and not left on or around chillers, in wall voids, within false ceilings etc.
- Regular inspection is needed during building or refurbishment works to ensure that materials are not being dumped into voids. Removal when works are complete may be expensive and/ or impossible.

What good looks like



Ceiling void is clear and easily inspected



Wall void with no litter or rubbish


What bad looks like







Rubble left in sub-floor void at end of construction project



Rubbish, and an uncapped pipe, left in a wall void following construction works

Internal pillars and RSJ's	
<ul style="list-style-type: none"> Particular attention should be paid to the integrity of any structural pillars joining to the floor. Fixing points should be embedded into the flooring material. Where RSJ's are encased in fire retardant material then this should be fully sealed against rodent access. 	
What good looks like	What bad looks like
	 <p>Fire cladding around RSJ showing extensive penetration by mice</p>

Internal drainage	
<ul style="list-style-type: none"> The fall into the drain should be sufficient to avoid standing water or settling-out of solids Drains should be kept clear of organic matter, with solids and fat traps in place as necessary. 	
What good looks like	What bad looks like
 <p>Internal drain with solids trap in place and cleaned regularly</p>	 <p>A dry toilet offers an easy entry route for rats from the sewer system. They will also pass through wet U-bends, so keeping them out of the sewer system below the building is also important</p>

	 <p>Rat emergence hole where plastic and earthenware systems meet</p>  <p>Decaying organic matter underneath a drain cover</p>
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Retail displays; freezers and chillers

- All voids under such units need to be accessible for cleaning, inspection, pest monitoring and control. These areas can accumulate food spillages and present a quiet, undisturbed area for pests to harbour.
- Access should be easy to achieve, and any plates or boards that need to be removed in so doing should be easily replaceable.

What good looks like




Services sealed with a metal cover plate

What bad looks like



Unsealed holes left under relocated units

	 <p>Numerous gaps around pipes and cables</p>  <p>Rodent chewed pipe lagging, emergence point is from floor services</p>
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Retail displays; gondolas

- All voids under such units need to be accessible for cleaning, inspection, pest monitoring and control. These areas can accumulate food spillages and present a quiet, undisturbed area for pests to harbour.
- Access should be easy to achieve, and any plates or boards that need to be removed in so doing should be easily replaceable.

What good looks like



Kick plate in good condition and easily removable for inspection

What bad looks like



Display unit with no access (under or behind) to inspect for pest activity

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Retail areas; concealed voids and cavities

- The creation of concealed voids and cavities must be avoided wherever possible.
- Any concealed void must have access available for pest monitoring and control.
- Access panels should be robust, whilst also being easily removed and replaced.
- Hinged panels with a securing mechanism are better than panels held in place by screws.

What good looks like



Same wall as in photo shown right, but with an access panel installed



Hinged inspection panel

What bad looks like




Panels either side of doorway have a small void between them and the blockwork wall, but no access to this is possible.



Box section with no access panel



Cavity creating panels have had to be removed from this infested area in a retail storage area.

Retail (in-store) bakeries	
<ul style="list-style-type: none"> The base of all plant should be thoroughly sealed to the floor to avoid problems with pest ingress and harbourage 	
What good looks like	What bad looks like
	 <p>Rodent penetration into insulation of an oven unit</p>

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