

Guidelines on Rodent Prevention and Control in Construction Site

Rodent Problem in Construction Site

Rodent infestation in construction site is not uncommon and in fact it is reported from time to time. The presence of large amounts of construction materials, construction waste and flimsy / temporary structures in construction sites can easily be turned into rodent harbourages if they are not managed / stored properly. Food debris / remnants and refuse that are improperly disposed of after meals / eating and the food-preparation or food-provision facilities that may be available in a construction site can be sources of food for rodents. Construction sites as well as their attached container offices often provide the basic living conditions (viz food, harbourage and passages) to rodents, and hence they are prone to rodent infestations.

Rodent Prevention and Control

2. Generally, rodent control methods can be classified into fundamental control and supplementary control. Fundamental control includes elimination of food and harbourages for rodent as well as implementation of rodent-proofing and rodent preventive measures, while supplementary control refers to direct control methods such as trapping and poisonous baiting.

Fundamental Control

Elimination of Food, Harbourage and Passage

3. Constant attention should be given to the availability of food, harbourage and passage for rodents, which are the most important factors that lead to rodent infestations. Rodents are omnivorous and they consume human's food as well as food residues / remnants. Particular attention should be paid to the storage and disposal of anything which could be taken by rodents as food. Food for human consumption should be kept in metal or glass containers with well-fitted covers. Disposal of all food debris / remnants / refuse in a proper and hygienic way is of paramount importance; they should be dumped in metal or plastic bins / receptacles with well-fitted covers but not littered around in order to cut the food sources for rodents.

4. Management staff of construction sites are advised to pay special attention to the following:

(a) Food preparation and storage facilities

Food preparation facilities might be present in some large-scale construction sites. In addition to the storage of food materials, certain amount of food waste / remnants might also be produced during the course of food preparation. All these would provide ample food supplies to rodents if they are not handled properly. It is recommended that the food preparation area should be situated inside a rodent-proof environment to avoid access of rodents (refer to paragraphs 5 to 7 below for details of rodent proofing measures). Bulk food should be stored in rodent-proof containers or rooms. Sacks or boxes of foods should be stacked up orderly on pallets in a way that allows thorough inspection for signs of rodents.

(b) Eating area

It is recommended to provide designated eating area(s) to workers / staff of construction sites as far as possible to facilitate waste collection / disposal. If food preparation facility is present, it should be located near to the eating area(s). Sufficient number of proper refuse collection facilities should be provided in the eating area for disposal of food debris, utensils, lunch boxes and drink cans, etc.

(c) Handling of waste and food debris / remnants

Rodent thrive whenever there are ample food attractions. Construction sites are aggregated with large number of workers and staff and they would produce considerable amount of food waste arising from the consumed lunch boxes, drink cans / bottles, food packagings, etc. All these would provide rodents with ample and handy food sources for speedy proliferation. It is recommended that all waste and food remnants / debris should be properly disposed of in rodent-proof refuse receptacles made with strong impervious material that come with close-fitting lids. Refuse receptacles must be placed on concrete floor or slabs with size larger than the area occupied by the refuse receptacles. Food and food-related waste should be stored separately from construction waste; they should be cleared duly and not be left overnight inside the construction sites.

(d) Storage of construction materials and waste

Prolonged and improper storage of construction materials could provide rodents with favourable harbourages. Materials such as lumber, plastic, paper, hessian sacks and fiber-board cartons are easily damaged and invaded by rodents. Construction materials should be stored in rodent-proof environment with concrete floor to prevent burrowing of rodents. Lumber and other materials or articles should be stacked on racks at least 45 cm above ground level. The stacks should be of size and with tidiness that any signs of rodent intrusion can be easily noticed by regular visual inspections. This is also essential to ensure an adequate aisle space between stacks and the walls to allow easy movement for inspections. A 30 cm band should be left between the stacks and the adjacent side wall, preferably painted in white for easy detection of rodent droppings and other rodent signs. Besides, construction waste should be disposed of in skips at designated locations. The skips should be landed on concrete floor and their doors should be kept tightly closed without any gap of greater than 6 mm to prevent intrusion of rodents. Woodpiles, bamboo poles and other similar waste should be cleared as frequent as possible.

(e) Container offices

Container offices are commonly found in construction sites. The voids underneath the container offices are frequently found encroached by rodents as harbourages. It is recommended that the container offices should land on concrete floor surface and the void underneath should be sealed with rodent-proof materials such as galvanised metal plates or concrete.

Rodent proofing

5. Rodent proofing is another important aspect to prevent rodent infestation. It should be applied whenever it is possible and practicable to do so, particularly for places where food is present.

6. There are many ways by which rats and mice may enter a building / structure, and a very thorough search is necessary to locate all possible means of rodent entry. In general, openings greater than 6 mm should be sealed or screened to block rodent (including rats and mice) movement. The principles / specifications / examples of rodent proofing are provided below for reference:

- (a) Rat holes and other small openings can be blocked by filling or covering them with appropriate materials (e.g. fine concrete, cement mortar, 20 gauge metal sheet or barbed wire balls etc.) after rodent disinfestation.
- (b) Broken or missing gratings should be replaced, and the apertures between bars of metal grating should not be greater than 6 mm.
- (c) Ventilation grids and other similar openings may be proofed either with 24 gauge expanded metal with 6 mm mesh, or with 22 standard wire gauge (SWG) galvanised steel woven wire cloth with 6 mm mesh.
- (d) Space beneath doorways resulted from worn steps should be repaired or renewed. Wooden doors have to be protected at the bottom by fitting a 20 gauge galvanised steel 'kicking-plate' of at least 300 mm high on the outside, with a maximum door clearance of 6 mm. A similar metal plate should be fixed to the door frame to form a continuous band of metal.
- (e) Openings and passing for pipes, wires and ducts through walls, etc. should be completely sealed.
- (f) Voids or 'dead' spaces in buildings may be inevitable and may in fact be purposely built to house some basic facilities (e.g. pipes, electrical conduits and air-conditioning ducts above suspended ceiling). Nevertheless, these voids should be made inaccessible to rodents and the materials and decorative finishing used should be resistant to gnawing by rodents. There should be no voids between the sides, backs and bottoms of built-in furniture and the adjacent walls or floors. There should be no voids greater than 6 mm in width behind wooden skirting. Voids among battens installed behind panel should be kept to a minimum and be made inaccessible to rodents, and the materials used should be resistant to rodent gnawing.
- (g) Places such as food preparation areas and food stores should NOT have false ceilings as the warmth of a food preparation area and the scent of food will attract rodents, and that a false ceiling will provide them with an ideal harbourage and nesting place. These areas / rooms should strictly leave no access, even the very small one, to rodents.

- (h) Vertical pipes could be used by rats to reach entry points or harbouraging places. A rat would find it difficult / unable to climb (by wedging itself) between a pipe and a wall / vertical surface or between adjacent pipes if the distance between the two supporting structures is at least 100 mm apart. Alternatively, they could be installed with a circular / inverted funnel shaped rat guard made of 20 gauge galvanised steel sheet, projecting about 230 mm from the vertical pipe and with diameter of at least 550 mm (assuming diameter of the pipe is less than 90 mm); the gap between the rat guard and the pipe should not be greater than 6 mm. Make sure there is no projection or any other structure nearby to serve as foot step for rodents to jump over the rat guard.

Supplementary Control

Trapping

7. Trapping is one of the common methods for controlling rodents. It is the preferred method when the use of rodenticides is considered undesirable, e.g. poisoned rodents dying in inaccessible areas would cause bad odour. Break-back / snap traps are used to instantly kill rats and mice, whereas wire cage traps are used to capture live rodents. Wire cage traps should be baited and set on the first day that they are laid. In general, wire cage traps found in the local market are designed for trapping rats, but not mice.

8. Only when encountering heavy rodent infestation where other rodent control methods have been exhausted without giving satisfactory results may glue traps be considered as a tool to supplement the rodent control programme. It is important to observe that glue traps should not be set outdoor or in areas with possible activities of other non-target animals (e.g. birds, cats and reptiles, etc.). Consideration may be given to enclosing the glue trap in a lockable, tamper-resistant rodent station or dedicated rodent glue trap tunnel for complete protection against non-target animals. Frequent inspections should be arranged to each glue trap laid and any trapped rodent should be collected and killed in a humane manner, and their carcass be properly handled / disposed of as soon as possible. To follow international recommendation, at least one inspection should be made every 12 hours. The use of glue traps should be suspended as soon as the situation of rodent infestation is alleviated.

9. Rats and mice feel safe by moving close to vertical surfaces such as wall, rather than across open areas. Traps should therefore be placed at right angle to the

vertical surface against which rodents are known or suspected to run. When snap traps are used, they should extend from a vertical surface at a right angle, with the trigger end facing the vertical surface (Fig 1). If traps are set parallel to the vertical surface, set them in pairs, with the triggers situated to intercept rodents coming from either direction. Similarly, when cage traps are used, they should also be placed at right angle with the opening of the trap facing the vertical surface. If they are set parallel to the vertical surface, they should be set back-to-back **in pair** (with opening facing the two ends) (Fig 2). The position for traps should be carefully chosen; they should remain in the same position throughout the trapping period and should be set firmly on ground whenever possible. Traps for catching mice are suggested to be placed about 1 m apart while traps for rats be placed about 3 to 5 m apart. The distances could be adjusted according to the actual environment as well as rodent infestation and activities.



Fig 1: Setting a snap trap at right angle to the vertical surface



Fig 2: Setting traps parallel to the vertical surface

10. If a non-target animal is captured and it is injured or suspected to be injured, contact Society for the Prevention of Cruelty to Animals (SPCA) at their emergency hotline 2711 1000 for assistance.

11. Thorough survey is needed to ascertain the locations of rodent harbourages and disposal routes. Base on the result of the survey, as many traps as possible and reasonable should be laid. **It is suggested that at least six traps should be laid for one or two rodents.**

12. Rats consume a great variety of food but they are very sensitive to the freshness of food, thus fresh baits should be used as far as possible and baits that have dried out or spoiled should be replaced immediately by fresh ones. Using mixed baits in traps can, to a certain extent, minimise the impacts of environmental factors, human practices, or variations in rodent behaviour on the efficiency of traps. As food preference of rodents varies from time to time and from place to place, food baits that work in a location at a particular time point may not have the same attractiveness to rodents in other location(s) or in the same location at other time points. Therefore, trials on different food baits should be conducted at the beginning of each trapping operation at individual location to find out the best combination of food baits. Based on previous test results, bread with peanut butter, barbeque pork (char siu) and sweet corn could be good baits for rodent trapping. Other appropriate food baits could also be included whenever applicable.

13. It is better to carry out repeated trapping programmes with a large number of traps laid for a few days, rather than distributing scattered traps over a wide area for a prolonged period. For a trapping programme, traps should be laid for at least five consecutive days.

Poisonous Baiting

14. The most commonly used rodenticides are anticoagulant rodenticides, which can be broadly classified into multiple-dose and single-dose rodenticides. Anticoagulant rodenticides would not induce bait shyness of rodents.

15. Multiple-dose anticoagulant rodenticides are effective against all species of local commensal rodents. The active ingredient of the rodenticide (Dustable Powder at concentration of 0.75%) should be added to and well mixed with other bait bases (uncooked rice, oil and sugar) to form a rodenticide bait mixture with concentration of 0.0375% before use.




16. Single-dose anticoagulant rodenticides are also effective against all rodent pests. They are formulated into different ready-to-use forms, such as scrap bait, block bait, etc. In general, scrap baits are more acceptable to rodents than block baits as the high wax content of the latter render them less palatable to rodents. The poisonous baits are to be evenly distributed in the target area according to the application rate as stated on the product labels. Poisonous baits should be pushed into rat burrows, thrown to places not readily accessible to humans and animals, placed in protected positions and other infested places (e.g. junk accumulation points). It is not advisable




to hang the poisonous baits at more than 5 cm above ground. It takes a few days for the poisonous baits to effect and most of the poisoned rodents will die within two weeks after ingesting a lethal dose of poisonous baits.


17. Anticoagulant rodenticides are toxic to humans; they should be handled with great care. Information stated on the product label should be strictly followed to ensure effectiveness and safety. Adequate verbal and written warnings must be given to members of the public, local residents and relevant parties to avoid any accidental poisoning.

Food and Environmental Hygiene Department
February 2025

Problems Commonly Observed in Construction Sites and Suggested Improvement Works

Item	Problems	Suggested improvement works
1	Food for guard dogs could provide handy food sources for rodents.	<ul style="list-style-type: none"> ● Food for guard dogs should not be left unattended (especially overnight) and should be cleared immediately after feeding.
2	Refuse collecting point provides food and / or harbourage for rodents. 	<ul style="list-style-type: none"> ● Ensure that the doors of the skip are intact and properly closed all the time. ● Refuse in refuse collection skip should be cleared timely and no food remnants should be left overnight.
3	Voids under site office / structure provide harbourage for rodent. 	<ul style="list-style-type: none"> ● The site office / structure should sit on rodent-proof material (e.g. concrete, small boulders forming a layer of 5 cm to 8 cm thick) which should extend to at least 30 cm around the base of the office / structure. ● Screen the underneath gap with 24 gauge expanded galvanised steel or 22 SWG galvanised steel woven wire cloth with mesh size not bigger than 6 mm. 

Item	Problems	Suggested improvement works
4	<p>Rodent could access through gaps greater than 6 mm.</p> 	<ul style="list-style-type: none"> ● If doors are made of wood or other soft metal, 20 gauge galvanised metal kicking plate of 30 cm high should be installed on outside of a door so as to protect the door and to reduce the threshold clearance to not greater than 6 mm.
5	<p>Accumulation of disused articles / construction materials</p> 	<ul style="list-style-type: none"> ● Promptly remove all disused articles / construction materials.
6	<p>Improper and prolonged storage of construction materials provides harbourages for rodents.</p> 	<ul style="list-style-type: none"> ● Construction materials should be properly stored in rodent-proofed places. Hoarding boards should be closely placed to one another to avoid leaving any gap greater than 6 mm. ● Construction materials should not be stored at close proximity to refuse collection facilities. ● Construction materials should be removed or relocated regularly to prevent harbouring of rodents.

Item	Problems	Suggested improvement works
7	<p>Loose and soft soil surface provides burrowing gound for rodent.</p> 	<ul style="list-style-type: none"> ● Pave the ground with concrete whenever possible. ● Conduct regular inspection and implement rodent control measures whenever rodent infestation is found.