Safety porch

Accidental escapes by birds that panic when you enter their aviary are surprisingly common. A safety porch limits escape possibilities and also provides a confined area where it is easier to catch up a bird. This excellent example at the Tierpark in Berlin is extremely substantial, although it might prove difficult to enter with a wheelbarrow for maintenance.

This triangular shaped safety porch cleverly provides access to two different aviaries.

If the central corridor is fairly narrow, it can also be used to “walk” birds from one aviary to another without the need to stress them by catching them. This corridor has doors that are designed to open across the corridor and form a barrier, and the opposite doors can both be opened to form a crossover route from the aviaries on one side of the corridor to those on the other side.

Providing access between aviaries.

This shows the use of doorways opposite each other to allow easy transfer of birds from one side of aviary complex to the other without the need to catch up and stress the birds. These were used to allow a new pair of Palawan peacock- pheasants to become acquainted, and then gradually introduced to each other, whilst separating them at night.

Pop holes

Pop holes allow birds to gain access to a night shelter or another aviary. The standard position is low down and near a corner, since pheasants naturally walk around the perimeter.

Beware architectural follies – one architect for a well-known zoo had only seen parrot aviaries and designed the pop holes for pheasants high in their roosts.

By running a piece of string through screw eyes, the pop hole can be opened and closed without entering the aviary, without the need to approach the birds closely. In the right hand photos, the aviary designer has constructed a very efficient system of chains, wires and pulleys that allow pop holes to be opened very quickly without entering the aviary.

Pheasant chicks are unable to fly when they hatch, although some can manage some flight after three or four days. However, it is not uncommon to find a pop hole into the roost or shelter which is too high for a newly hatched chick to
manage. In very damp weather, this would mean the hen needing to care for her chicks in an unsheltered area and, under these conditions, chicks can easily get wet and then chill to death.

If there is a difference in ground levels between the main aviary and the shelter, a pile of sand can quickly be raked into position to provide a slope up which chicks can follow their mother into the dry. Alternatively, as in the photo here, you can have a ready-made ramp to put in place when the chicks are expected to hatch. Note, however, the dangers of this ramp where a chick might just get underneath and get lost. This Palawan hen has parent-reared for many years and, like all peacock-pheasants, keeps her chicks very close.

At Blossom aviaries in Himachal Pradesh, where there has been a pheasantry for rescued cheer pheasants for many years, the aviaries were built on the side of a steep hill. A series of terraces provided a number of flat areas within each aviary. Each terrace was about 18” (0.5 m) below the next. The night shelters were constructed at the highest point of each aviary. When the cheer pheasants began to rear their own young, each family was hatched on the highest terrace as the nesting sites were under the night shelters. Gradually, as the hens and chicks explored their large aviaries, they worked their way down the terraces, ending up at the lowest level. The “step” up to the higher terraces was too high for the chicks so they remained on the lowest terrace at the bottom of the aviary. Of course, although their hens tried to take the chicks up to the dry when it rained, the chicks were unable to manage the steps. In light rain, the hen could cover the chicks but, when the monsoon started within a couple of days, rain fell so heavily that it cascaded down the aviaries and formed a large pool at the bottom in which the chicks drowned. The aviaries were then modified to provide a slope in place of the terraces and no further chicks were lost.

### Aviary design - circular

A cartwheel wheel-like design by Keith Howman. This design has one central corridor. It is good to keep food secure and dry and away from the public. It has a built in covered safety area for food bins, brooder boxes, etc. It is also easy for keepers to access aviaries without causing much disturbance to the birds. This design gives a good view of the birds for the public and a small shelter at the back for the birds, with a sand area under perches to make cleaning easier. However, if the birds wish to get away from the public, they have only a limited area to use.
Aviary design – Sarahan

Sarahan Pheasantry in North India – circular. This is where the first Western Tragopan was bred in 1993. Note it is an all metal construction because of termites and a variety of predators, including leopards!

At a similar aviary in Sungkai, Malaysia, a Crested Fireback wild male walked out of forest into the access corridor seeking to mate with captive female.

Aviary design – some alternative plans

The night shelters are on the outside of this complex, as the birds are in need of shelter and privacy – i.e. breeding quarters where the public are excluded. It provides good protection from drafts since the backs of aviaries are solid and it also cuts down on heating bills with the roosts adjacent to each other.

The layout of the bank of aviaries on the left, where the internal partitions between the aviaries have been staggered, provides the same area of aviary, but give more variety for the birds and offers additional nest sites and security for hens.

Dividing panels between aviaries

Angle the internal walls between the aviaries to provide variety for the observer and security and nesting sites for the hens. Also note the paving slab inside the door to avoid wear on the grass by the keeper.

Aviaries with irregular walls

These large aviaries at Sparsholt College near Winchester in the UK have been constructed with “zig-zag” walls which create many corners for hens to nest and hide. Once shrubs have grown in the corners, these are ideal pheasant aviaries.
Major Iain Grahame’s design to accommodate different species in different sized aviaries in one aviary block.

**Boarding between aviaries**

It is always best to ensure there is a visual barrier between each pheasant aviary. If this is not present, invariably there are problems between the birds, whether of the same or different species.

- **Problems with fighting between pens**
  Cocks and hens from different pairs become very territorial and will fight through the wire if they can. The experience of finding a satyr tragopan cock killed through the wire by a peck to the head from a brown eared pheasant in an adjoining aviary taught the author a painful, but valuable lesson.

- **Distractions from breeding displays**
  Even if they don’t fight, males try to impress females in adjoining aviaries, often concentrating more on the neighbouring hen than on their own mate. This does not encourage good breeding.

- **Security of chicks**
  Chicks can get through small mesh very easily, and they certainly don’t see a pheasant in the next pen as a potential enemy. Even standing close to the wire can result in death or injury to a chick. It can be horrendous to see a Himalayan monal female catch a very young Temminck’s tragopan chick and literally pull it through the small mesh between their aviaries. Of course, the chick did not survive. Therefore, a solid barrier can be a great protection for chicks.

- **Public viewing better**
  As can be seen from the next photo, open aviaries can look really good to members of the public, but they are not necessarily bird friendly.

**Open aviary**

There are no visual internal barriers between the birds – this looks very good and allows excellent views of the birds, but may result in distractions and fights.

Example of a satyr tragopan male displaying to a Temminck’s hen in the adjacent aviary.

Temminck’s tragopan male distracted from breeding by a satyr male next door.
One fairly inexpensive way of providing solid as well as visual barriers between avaiaries is to use feather edge fencing board, as in these peacock- pheasant avaiaries at Keith Howman’s.

Rustic pole construction
The use of rustic poles can be used to create an aviary which is pleasing on the eye and is less intrusive than some materials. However, the poles are often not treated with preservative and therefore have a more limited life than wood that has been tanalised.

Brick fronted
Keith Howman’s design
A more solid and permanent construction to divide avaiaries. These need good foundations and are more expensive, but can be much more secure and should deter any mice or predators from transferring between avaiaries. Care should be taken to ensure that birds cannot stand on the top of the wall between adjacent avaiaries. Incorporating brick can make avaiaries much more secure. However, there were avaiaries in Zoo Negara in Malaysia which had stone walls. Unfortunately, the walls had sufficient gaps in the mortar for large numbers of rats to colonise the whole area.

Brick based with welded metal framework
This group of avaiaries provides great security against any form of predators, but is expensive compared to other constructions unless you have building skills. Many parrot breeders construct such avaiaries as their birds would destroy wooden framework. Fortunately, pheasants do not have such destructive tendencies.

Pens for quail, partridges and francolins
These species are not covered in this book, but excellent advice can be obtained from books on these species by Gary Robbins, obtainable from WPA or AB Incubators.
Aviary wire mesh

If you know that your aviaries will be constructed within a secure area where predators will have no access, then some form of string netting is undoubtedly the easiest and most economic material. Otherwise, you are likely to take the decision to use wire mesh to secure your aviaries.

Wire mesh comes in different thicknesses and the space between the wire can also vary considerably. The thickness of the wire is known in the UK as the gauge. Nineteen gauge is much lighter and thinner than 16 gauge, and therefore quite a bit cheaper. These two gauge sizes are adequate for pheasants, since they do not destroy wire with their beaks in the way that some parrot species can. Nineteen gauge will keep out small predators, like cats but not a determined fox or badger. Some zoos need even thicker gauge wire to keep members of the public out! Whatever mesh you decide to use, make sure it is galvanised which will make it last much longer.

The cheapest and thinnest wire mesh is that used to construct chicken runs cheaply, so this is often known as chicken mesh. The spaces are usually hexagonal. If you have no likely predators, chicken mesh can be adequate, although its construction means that it can stretch out of shape very easily. However, most experienced avairy builders find that the cheaper chicken mesh is often a false economy as it breaks easily and certainly does not last more than a few years before deteriorating.

Mesh that has been welded into a square or rectangular shape is much more rigid and long lasting is usually known as weldmesh and even the thinnest 19 gauge will usually last 15 years or more. but 16 gauge is more likely to keep out predators. Although a little more expensive, 16 gauge weldmesh is more likely to keep predators out as well as the advantage of being able to support a much greater weight, especially on the roof, so heavy snow or occasional falling branches cause little damage. Of course, it also will last much longer and aviaries have been known to last 30 years..

Decide on the mesh spacing after assessing what you will need to keep out of your aviary. Experience has shown that one inch by half inch keeps out all but the smallest field mouse. If you wish to deter even these, you probably need half inch by half inch. Larger mesh sizes will allow other creatures in to the aviary and in these times when avian influenza threatens birds, and it is advised strongly that you try to keep out all wild birds that would love to feed on your pheasant food.

The traditional way to fix aviary wire to a wooden framework is by using staples – (galvanised U shaped nails). These can be difficult to hammer in unless you are fortunate to own an electronic stapler. Galvanised nails with wide heads (known as “clouts” in the UK) are much easier to manage and hammer in and do not pull out of the wood as easily as staples. They are also much cheaper. By using the wide head of the nail to cover a corner of the mesh, even large areas of netting can be affixed very quickly and easily. If you are attempting the task on your own, nails can be driven in halfway and the wire hung and adjusted until it is in the right position. Then the nails can be driven in fully, pinning the mesh to the framework. An example can be seen in Photo A.
Large aviaries are almost certain to need mesh to be joined. Special galvanised clips can be purchased and fitted using pliers. Overlapping the edges of the wire can provide much better security; wire joined as in Photo B is not nearly as strong as in Photo D. Another way to join two pieces of weldmesh can be seen on Photo C. Here a thick piece of wire has been tensioned between the two edges of mesh and a thin wire has then been interlaced to hold them all together. The tensioning wire certainly adds stability to the join. However, this will need regular inspection as the thin interlacing wire will not last as long as the mesh and, once a break occurs, the whole section can be undone very easily by a persistent intruder, such as a squirrel.

Every nail or staple dropped within an aviary during construction is a potential death sentence to any pheasant that will live there, particularly digging pheasants that seem able to swallow almost anything. If you are constructing your own aviary, you are likely to take the greatest care in finding dropped nails, but contractors are unlikely to show the same degree of care, so a very careful examination after construction could save a valuable pheasant’s life later.

**Bitumen on aviary wire**

This photo shows even more clearly how wire netting can almost disappear from view if covered with bitumen paint.

**Plastic coated wire netting**

In this aviary in Austria, plastic coated wire netting has been used and it is very unobtrusive. The plastic coating probably also extends the life of the netting by a number of years, but this material has not been available for sufficient time to know the effects of prolonged sunlight on the plastic. It is more expensive than normal netting, but is easily put in place with galvanised nails.

**Enclosing a large area**

Long-lasting nylon netting can now be produced to cover large areas without the need for seams or joins. At this aviary complex in Germany, the owner has used large poles with metal dustbin lids fixed to the top of each pole to stop it breaking through the netting. Cables have been stretched between the poles to support the netting. The owner has joined the netting to the front of his aviaries.

In the UK, such a structure would require planning permission from local government. It is excellent for
waterfowl and birds, such as cranes and allows these birds to fly freely within a large area and avoids the need to trim wing feathers. However, most pheasant species would end up fighting if several of them were kept within such an area, which is why the owner of this complex keeps his pheasants in aviaries alongside of the large netted area. One pair of his pheasants are allowed out onto the grass at a time. Another major danger to pheasants within such a construction is the large pond. Pheasants cannot swim and often end up drowning when kept permanently within such an aviary. Even if adult birds survive, young pheasant chicks seem to show a remarkable ability to drown in even the smallest pond. If pheasants are held in such areas, the owner will need to evaluate carefully what other species are kept in the same space – the cranes here would certainly eat pheasant chicks.

In an area where heavy snowfall is expected, the weight of the snow will often cause the netting to rip through the poles, allowing birds to escape or causing them to be crushed by the falling roof. If rain falls during winter and this subsequently freezes, the build-up of ice on the netting can also have a similar effect.

Predators are much more difficult to keep out of such a construction; rats and squirrels find it relatively easy to gnaw through a corner to gain access to the bird food within. Many breeders use solid aviary complexes around the perimeter to deter predators and then net over the internal area.

At a time when diseases such as Avian Influenza pose great threats, this system has the advantage of keeping birds under quite natural conditions and limiting their contact with wild birds that might carry diseases. However, it does not stop the transmission of disease from wild birds passing overhead. During outbreaks of avian flu within Europe, veterinarians and government officials have decreed that birds in this sort of enclosure must be moved under cover where disease transmission from wild birds is impossible.

One great use for this type of construction is in release pens, and most game farms use temporary pens to acclimatise their birds before release. Similar temporary large pre-release pens can be easily constructed for pheasants that are being released in reintroduction programmes, and they have the advantage of being usable on many different occasions in a variety of locations.

**Dividing walls**

Here, an excellent dividing wall between two aviaries at a well-known zoo still has a flat surface on which the birds very obviously roost and spend a great deal of time. Additional wire has needed to be put in place to stop the birds worrying each other. If the wall had been given a steeply sloping surface, none of this would have been necessary.

**Aviary floors**

- **Wire mesh for security**

  Wire mesh on the floor deters diggers such as monals, and adds security against predators – grass grows through without being killed off at the roots. However, it may be hard on birds’ feet. One idea is to use temporary wire covering to re-seed heavily used areas, which is best done whilst the hen is sitting, as only the male bird will be using the aviary most of the time. At these times, a variety of grass which grows extremely quickly, such as “Canada Green” can prove very useful.
• Grass
  Remember the effects of “diggers”, such as cheer, monals and the eared pheasants. On the other hand, koklass need large areas of grass – about 400 sq. ft. (40 m²) minimum - more when they have young. Re-seeding and protection of particular areas with mesh needs to be budgeted for.

• Sand
  Sand is hygienic and easy to keep clean and to disinfect. – there is no need for grit in the diet for digestion or for egg laying. Sand also looks good when raked and it drains well, particularly if retained by boarding. In very wet areas, or those prone to minor flooding, raising the birds above the surrounding land area on sand can keep their feet dry and be much healthier. One well-known breeder has recently begun to keep his birds on a small rounded grit, known in the UK as horticultural gravel. He has found this has cut down dust levels inside the heated night quarters of his tropical pheasants, and the rounded grit doesn’t harm the birds’ feet.

• Bark chippings
  Natural materials replicate areas such as forest floors, which are can provide a natural environment for many species. Bark chippings can be acquired easily from garden centres and other horticultural outlets and they offer the pheasants, particularly those that like to dig, the opportunity to keep very active, turning over the debris and seeking titbits of food. This material needs to be raked regularly so that mould does not develop and most keepers who use this material change it every six months or so. If large amounts of mould are allowed to develop, it can create a very unhealthy environment for the birds.

• Dried leaves
  If you have access to large amounts of dried leaves, these will provide hours of interest for the birds as they rake through them seeking food. As with bark chippings, care should be taken to ensure mould does not develop.

• Raised above ground level
  In many zoos, where expense is less of a problem, raising the internal level of an aviary by about 30 to 60 cm can counter drainage problems, particular in tropical regions with very heavy rainfall. Drainage pipes can be inserted into the substrate to clear water rapidly. The ends of these pipes must be covered in wire to deter rats and mice from climbing up them into the aviary.

• Mud
  Mud is what you get if you don’t provide anything else. It is unpleasant for the birds in areas where there is poor drainage, especially on clay soils. This problem is often very noticeable in small aviaries where birds soon reduce turf surface to mud.

Grassed aviary – mountain peacock-pheasants

  The aviary must be sufficiently large to sustain use through all seasons of the year; some species inflict heavy damage on any grass – e.g. monals, eareds and cheer. Tragopans seem to need a minimum of about 500 sq. ft (50 m²) of grass to live on, since they crop it consistently. In winter, when grass stops growing in many areas, unless there is sufficient, the birds just wear it out.
Roosts/shelters—unheated for hardy species

Here, these satyr tragopans receive shelter from the wind with solid wooden walls to their roost, and shelter from the rain provided by clear plastic corrugated sheeting. Nothing more is needed, since these Himalayan birds are totally hardy under UK conditions.

Roosts/shelters—heated for tropical species

These Malaysian peacock- pheasants have a fully insulated shelter, with double panelled wooden walls and 2 inch thick polystyrene sheeting between the wooden panels. Triple wall polycarbonate sheeting has been used on the roof. Other tropical species have their roosts attached so that heat generated in one shelter can help to keep the other roosts warm. Because the insulation is good, comparatively little heating is needed to keep the birds snug in the coldest of winters. Tropical species will require a minimum temperature of around 7 °C and should be shut in at night. Care needs to be taken to ensure that no mice can gain access to the insulation material, or they will nest there and live happily on the birds’ food.

An additional advantage of a heated shelter is that it can act as a “hospital” area if a bird is unwell. The bird can be walked in without needing to be caught and adding to its stress levels.

A tubular oil-filled heater powered by electricity is very easy to install and will usually run happily for years without any problems. For greater economy, the heater can also be used with a thermostat.

Roosts / shelters – polycarbonate roof and lighting in aviary

An overlap on the polycarbonate roofing sheet keeps the entrance area to the shelter dry. It is useful to have some form of lighting both inside the roost and in the aviary. Should a tropical bird decide to roost outside on a cold, frosty night, it can easily be ushered back indoors with the lighting turned on. There is then no need to handle the bird and cause it to panic.

Roosts/shelters—internal lighting and power

Taking electricity to an aviary complex often requires running an armoured cable from one’s house. Often, this is buried underground and then run to a separate fuse board. Always seek professional advice if you are not a professional electrician.

As well as having internal lighting, it is useful to have the occasional power socket within an aviary. Power tools can be plugged in easily if small repairs need to be effected. Peacock-pheasants do not crop the grass in their aviaries so, in large grassy aviaries, a small electric mower can be plugged in easily. If a bird is sick, access to a power point can provide a heat lamp quickly and effectively.