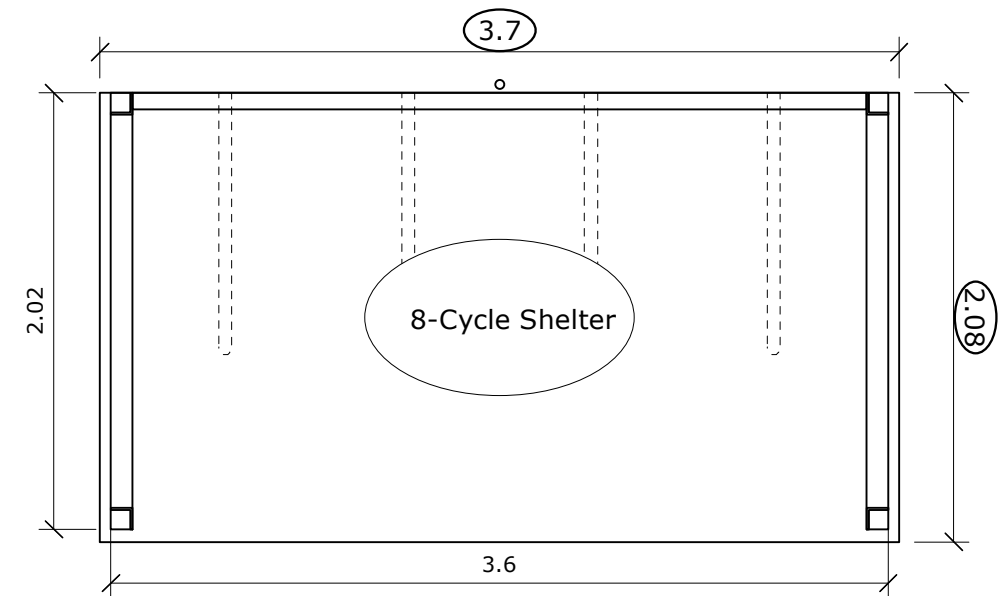
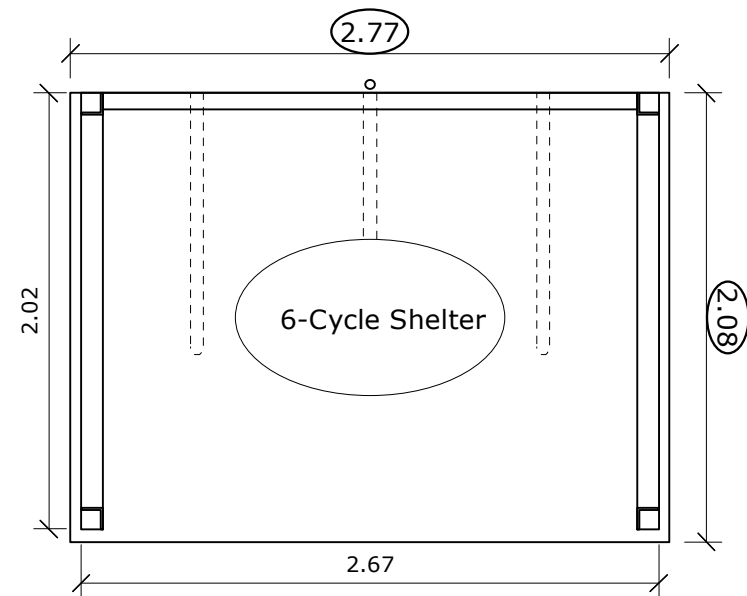
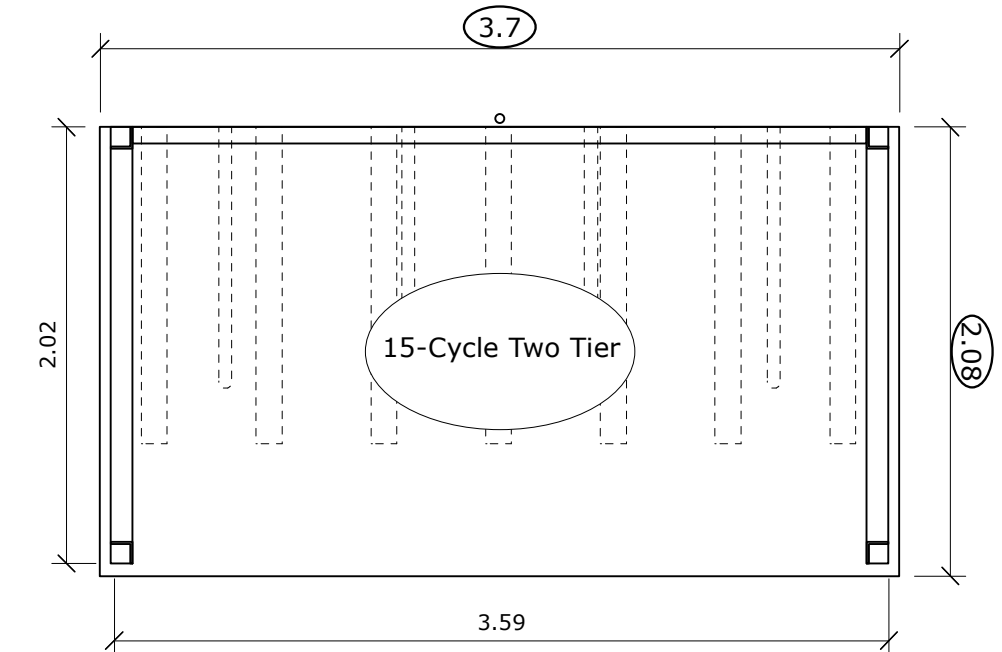
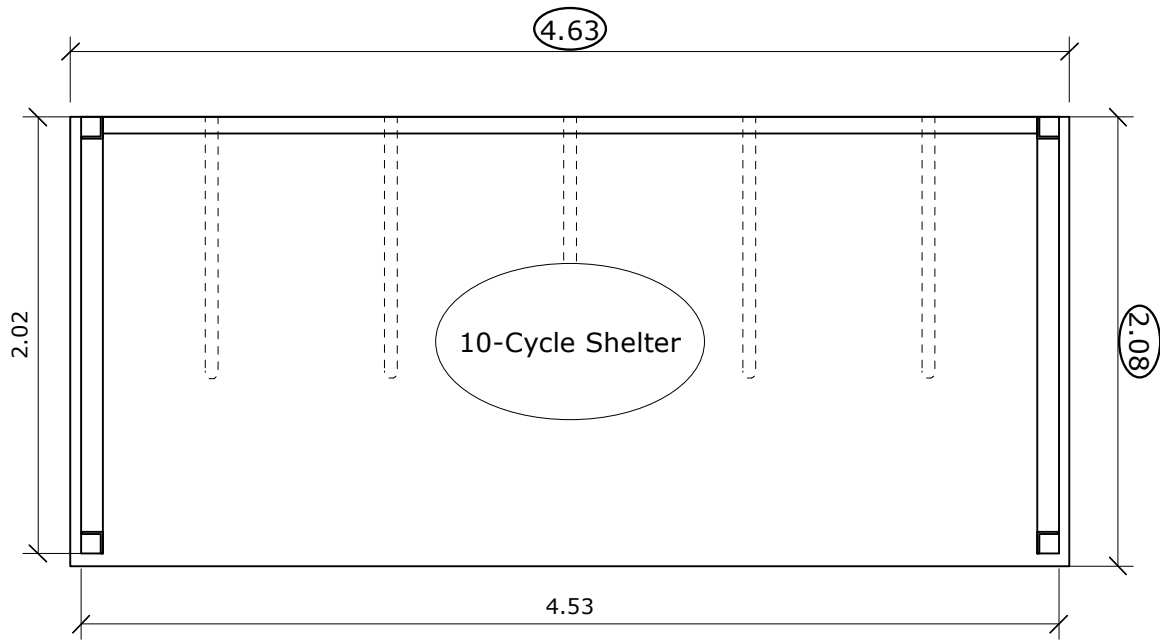


GREEN ROOF SHELTERS LIMITED



Regular Cycle Shelter Height 2.25m
2 - Tier Shelter Height 2.93mx



(2.xx) Roof Dimension
- Other dimensions ground level

Needs 2.4m clear spacing in front of shelter for upper tier loading.

Green Roof Cycle Shelters _ **Ecological Data Sheet**

In addition to secure cycle parking or bin storage, Green Roof Shelters supply the additional features:

- species-rich biodiversity (a substantial biodiverse green roof),
- SUDS (sustainable urban drainage),
- invertebrate-nesting wall panels and bird nesting boxes,
- a green roof that's visible at head height,
- summer cooling (evapotranspiration),
- education / explanation (interpretation panels),

Roof substrate, plant species and roof habitats

Roof substrate

With a substrate depth of **150+mm**, the low nutrient growing medium can support a broad variety of nectar-rich planting. **Mounding** and varying depths of substrate allow different plant species to co-exist.

The roof substrate's rainfall retention and slow rate of runoff contributes to SUDS and evapotranspiration.

Biodiverse roof planting

Planting is drought tolerant, thriving on the low-fertility substrate and in 'stressed' environments. Roofs are not intended to be 'gardened', but left 'wild', reflecting the seasons and provide much needed nectar-source plants for bees, butterflies, hoverflies and other invertebrates and is largely free from disturbance by people, dogs, and herbicide spraying.

We plant our roofs with a diverse mix of native wildflower plants (& some non-natives as early & late nectar sources)

Typically we plant **46+ plant species** on each roof, both as plug plants and seed. Planting can be tailored to particular local conditions or BAPS target species. Over subsequent years, planting will change according to the success of different species in your location and climate, and incoming plant seeds.

Roof habitats

We include areas of bare ground on the roof to allow wild plants to colonise, sand mounds for ground nesting solitary bees, and part-buried log piles as important invertebrate habitat.

Shelter sizes / Roof Areas

Green Roof Shelter roofs meet and exceed Green Roof Grocode 2014. Each shelter for 6 bicycles provides **5.7m²** of growing roof habitat.

8 and 15 (2 Tier) cycle shelters provide **7.5m²**, and 10 cycle shelters provide **9.6m²** of growing roof habitat.

Habitat wall panels and nesting

Habitat panels

Durable coppiced UK chestnut, drilled for solitary bee nesting. We use all the hole sizes for UK hole nesting solitary bee species. (We also make space for ground nesting bees on the roof.)

All shelters have bird nesting boxes, for blue or great tits, or social nesting boxes for house sparrows.

We often include (especially for schools) habitat panels containing sheep's wool - that birds can be seen taking for nest-making.

At ground level, we use crushed reclaimed brick and concrete gabions, both as shelter ballast weight, but also as invertebrate refuge.

Interpretation panel

Shelters have a graphic interpretation panel that explains what's (typically) growing on the green roof - plant species - and the benefits of all pollinators and wildlife in general.

Habitat and nesting: volumes and areas

Each shelter typically has **1.6m²** of habitat nesting material per shelter (12 habitat nesting material panels).

Over 1000 drilled holes, in durable coppiced UK chestnut, for solitary bee nesting, in increments from 2mm to 8mm - with the potential for brood nesting of 8000 solitary bees.

Each shelter has **1.1m²** of rubble gabions at ground level as invertebrate refuge.

Green Roof Shelters can contribute to credits in the following BREEAM categories:
POL5: FLOOD RISK - To encourage development in low flood risk areas or to take measures to reduce the impact of flooding on buildings in areas with a medium or high risk of flooding.

LE4: MITIGATING ECOLOGICAL IMPACT - To minimise the impact of a building development on existing site ecology

LE5: ENHANCING SITE ECOLOGY - To recognise and encourage actions taken to maintain and enhance the ecological value of the site as a result of development.

LE6: LONG TERM IMPACT ON BIODIVERSITY - To minimise the long term impact of the development on the site's and surrounding area's biodiversity.

Green Roof Shelters can also have a more indirect impact on other sections of BREEAM.

All Green Roof Shelters comprise:

Structure (see structural engineer's drawings) comprising: BS EN 1993-1 Eurocode 3 – **150mm x 150mm x 10mm steel, 100mm x 100mm x 8mm steel, 100mm x 75mm x 8mm steel**. All hot-dipped galvanised to EN ISO 1461. Other mild steel sections and mesh panels are either hot-dipped galvanised or polyester powder-coated to ISO9001:2008

Growing roofs, comprising: 304 grade stainless steel roof trays, with stainless steel outlets; 10mm synthetic fibre drainage & water storage mat (6ltrs/m²); gutter (internal) and downpipe (external) to convey any rainfall in excess of substrate capacity; **150-200mm** low nutrient growing medium comprising crushed brick, fly-ash aggregate, fines, bark and a small amount of green waste.

(‘Walls’) Rubble gabions in HDG weld mesh; Wildlife habitat panels comprising drilled UK chestnut rounds (solitary bee nesting), bamboo (solitary bee nesting), sheeps wool (bird nesting material); UK grown Larch cladding as optional wall panels/infill.

As an example, a Green Roof Cycle Shelter (8 bikes) has a 7.5m² green roof (weighing 225kg/m² when saturated) and a plant species mix of 46+ nectar-rich native plants (with some additional non-natives to extend the nectar season for early and late pollinators - bees, butterflies, moths and other invertebrates).

Each shelter typically has 1.6m² of habitat nesting material per shelter - with drilled holes in varying sizes in durable coppiced UK sweet chestnut, for solitary bee nesting (harmless and important pollinators)
Roofs have additional invertebrate consisting of log piles and sand mounds.
All shelters have bird nesting boxes, for blue tits or great tits, or social nesting boxes for house sparrows, and information/interpretation panels.

Sustainability & re-use

Green Roof Shelters comprise a carefully considered material selection incorporating reused and recycled materials. The robust galvanized structural steel construction, engineered to support roof loads (225kg/m²) and UK conditions, often has an average 55% recycled steel content.

Stainless steel roof trays are used for longevity.

The growing substrate for the green roof is a mixture of recycled and waste materials - crushed brick, fly-ash aggregate, fines, bark and a small amount of green waste.

We use UK grown Larch and Douglas Fir for its durability, weathering suitability and appearance.

Drilled Chestnut logs (for solitary bee nesting) come from our own coppice woodland.

Wildlife Habitat & Nesting panels use a variety of natural and manufactured materials - coppiced chestnut, sheep's wool, bamboo.

At ground level, we use crushed reclaimed brick and concrete in gabions, both as shelter ballast weight, and as invertebrate refuge.

Shelters are easily relocateable should needs arise (using the same method as original delivery - lorry with mounted HIAB crane).

Simple repairs or disassembly are designed for.

All shelter materials are suitable for re-use or recycling.

Technical

Shelters conform to BS EN 1993-1 Eurocode 3 with structural steel sections hot-dipped galvanised to EN ISO 1461. Other mild steel sections and mesh panels are either hot-dipped galvanised or polyester powder-coated to ISO9001:2008

Security

Green Roof Cycle Shelters meet (& exceed) many different standards for security, access, & sustainability (compliant with differing levels of SBD, LPS, Sold Secure, Code for Sustainable Homes).

They meet London Cycling Design Standards, numerous City Council standards, and Sustrans best practice for cycle parking.

How cycle parking is incorporated into a new or existing development determines the level of security (eg. whether cycles are overlooked / passive surveillance / proximity to building entrances). Best practice in siting cycle parking is in well lit areas, that are ideally overlooked by building occupants or passers-by.

While cyclists' own locks are often the ultimate and last barrier to theft, Green Roof Cycle Shelters are carefully designed and manufactured to be robust, endure well and withstand damage or attack.

Guarantees

Different materials and their finishes have different guarantees.

Hot Dip Galvanized elements are rated as 35+ years.

Polyester powder-coated elements have 15+ years durability.

Green Roof Shelters use powdercoating over hot dip galvanised material and

aluminium parts, both of which have good lifespans and durability.

Green Roof Shelters Ltd has Product, Public and Employer's Liability Insurance, and fulfil 'reasonable skill and care' in the design and manufacture of Green Roof Shelters, in the common definitions of Design Responsibility.

GRS 2023



A building and wildlife habitat delivered in one

Operation & Maintenance Manual. Green Roof Bicycle Shelters: Secure, sheltered cycle parking with living roofs and a rich biodiverse habitat.

Contents:

!

Introduction

- 0.1 Before you begin any work on the shelter read the following:**
- 0.2 Useful contact information**
- 1.0 Material construction of Green Roof Shelters**

Maintenance

- 2.1 Green Roof Shelters one day maintenance checks and training**
- 2.2 Watering**
- 2.3 Weeding & Planting preferences**
- 2.4 Keep the gutters and drainage unblocked**
- 2.5 Roof trays**
- 2.6 Habitat Panels**
- 2.7 Cleaning**
- 2.8 Relocation**

Record

- 3.1 Log book**



Introduction

0.1 Before you begin any work on the shelter read the following:

- The large quantity of substrate means water runoff is slow, and water drips off the roof long after rain or watering has ceased. This is normal.
- Green Roof Shelters' roofs are designed to support plants with an extended nectar season and greater wildlife value, and weigh much more than less substantial green roofs. Any appearance of significant corrosion or rust on structural steel should be investigated to find the source.

0.2 Useful contact information

Design team:

Dan Monck & Duncan Kramer
Green Roof Shelters
115 Bartholomew Road
NW5 2BJ
020 7485 7618
info@greenroofshelters.co.uk

Planting and Wildlife Specialists:

John Little & Dusty Gedge
07967 733 720
info@greenroofshelters.co.uk

1.0 Material construction of Green Roof Shelters

Structural steel sections all hot-dipped galvanised to EN ISO 1461.

Other mild steel sections and mesh panels are either hot-dipped galvanised or polyester powder-coated (to ISO9001:2008)

Powder coated elements on this shelter will be a specific RAL colour. Please contact us for the RAL colour used on this shelter.

Roof trays and cappings are Stainless steel 304 grade.

Internal gutter and downpipe: polyester powder-coated aluminium.

Recycled black HDPE packers & buffers.

Habitat & nesting panels comprise: UK larch bird box, UK chestnut solitary bee nesting, recycled sheep's wool nesting materials.

Timber cladding / corner posts: UK grown larch.

Maintenance

2.1 Green Roof Shelters one day maintenance checks and training

Green Roof Shelters offer one day maintenance checks and training. Please contact the GRS team at info@greenroofshelters.co.uk to find out more and book.

Included in the visit:

- Drainage inspection and clearing.

- Wildlife health check.

- Weeding.

- 1 hour maintenance guidance with Q&A.

2.2 Watering

When green roof shelters are installed during the spring / summer growing season, **watering may be essential** to establish the roof. This means during the first growing season we recommend that each shelter is watered across the whole roof surface at least once every 2 weeks - 10 minutes watering for each shelter. Continue watering even if water begins to run off the roof and through the gutters, to ensure the whole roof is saturated.

2.3 Weeding & Planting preferences

NOTE: The nature of a biodiverse living roof is to encourage a diversity of native plant species. Therefore, a different criteria to that used when 'gardening' in the traditional sense should be employed when weeding the roof. During the period when the roof planting is becoming established, it is helpful to remove incoming invasive plants/weeds a couple of times per year.

Never use sharp tools or machinery such as garden spades or forks on the roof as they risk puncturing the roof trays.

Weed the roof from a step-ladder or securely placed ladder; the responsibility for safety lies with the individual/contractor.

Some considerations when selecting which plants to remove:

- i. Remove any tree species which take root on the roof.
- ii. If one plant becomes dominant across the roof, consider removing parts of it to give other species a chance.
- iii. Contact Green Roof Shelters if advice is needed about adding particular species for desired invertebrates.

2.4 Keep the gutters and drainage unblocked

It is essential the roof drains freely and regular checks should be made to ensure that the gutters and downpipe are free from leaves and debris. Checks are especially necessary during the autumn months.

2.5 Roof trays

If subsequently fixing anything to the Green Roof Shelter (eg. electrical conduit or data), do not drill or screw into the stainless steel roof trays.

2.6 Habitat Panels

During the first year there will be **natural tannin seepage** from the drilled sweet chestnut logs in the habitat gabions (this is what makes the drilled logs naturally durable). Tannin staining on the shelter is not rust! It can be washed off if need be, but will fade away in due course if left.

Bird boxes can be opened - if necessary - simply unscrew the centre front screw and hinge the front up (it may be a little stiff). Don't do this during the nesting season.

Wool-filled gabions will look a bit fluffy when birds start to gather wool for their nest lining.

From time to time the contents of the habitat panels may settle, reduce in size, deteriorate or want replacing with an alternative material. To do this prise open mesh clips located on all four sides of the panel. Replace the contents as required and re-attach with new clips or other suitable retaining connectors. Green Roof Shelters Ltd can advise.

2.7 Cleaning

Galvanised and powder coated materials can be cleaned with water and mild detergent.

Abrasives may damage powder coated parts.

Specialist cleaning advice should be sought for anything resistant to light manual cleaning.

2.8 Relocation

All Green Roof Shelters are designed to be relocatable should the need arise. Lifting is done by lorry-based hiab or crane, (the reverse of the delivery procedure) and must be done by a competent operator.

Any connections to power or water must be disconnected.

Record

3.1 Log book

Use the following table to log any alterations made to the shelter building which may impact on this manual or future works:

DATE:	NOTED BY & CONTACT DETAILS:	DESCRIPTION: