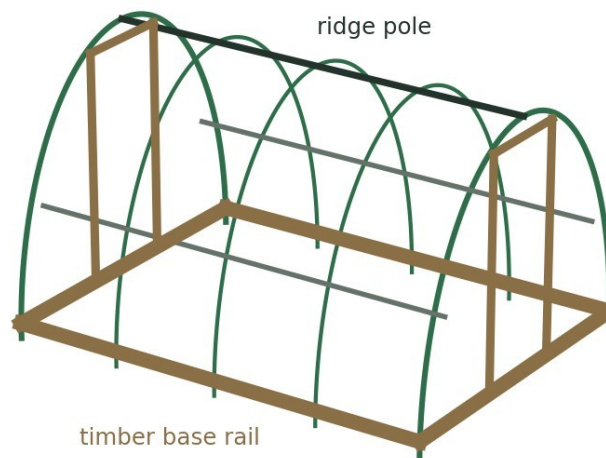


PRINTABLE BUILDING PLANS

DIY POLYTUNNEL

3 m × 4 m walk-in garden tunnel



GENERAL ARRANGEMENT | 3,000 W × 4,000 L × ABOUT 2,100 H (mm)

Flexible PE hoops | Timber base | Two-door airflow

Metric dimensions with useful imperial equivalents

Read This Before You Buy Materials

A polytunnel can look forgiving while it is being built. Wind is less forgiving. This plan uses a square timber base, ten driven pins, six earth anchors, five closely spaced hoops and bracing at both ends. It is sized for an ordinary home garden and a calm-to-moderately sheltered position.

Design limit

This is a practical DIY garden plan, not an engineer-rated structure. It carries no stated wind or snow-load rating. Use a manufactured, rated kit or obtain local engineering advice for exposed coasts, cyclone or hurricane zones, heavy snow areas, loose fill, peat, saturated ground or public/commercial use.

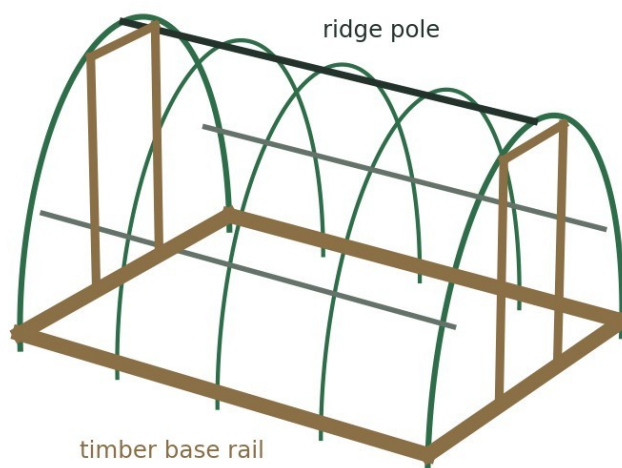
Project at a glance

Item	Specification
External footprint	3,000 × 4,000 mm 9 ft 10 in × 13 ft 1 in
Ridge height	About 2,100 mm 6 ft 11 in
Hoops	Five 40 mm UV-stable PE pipes, each 6,000 mm long
Hoop spacing	1,000 mm centres 3 ft 3 in
Doors	Two aligned openings, each 900 × 1,900 mm clear
Cover	180 to 200 micron UV-stabilised greenhouse film
Interior	Two 1,100 mm beds and one 800 mm central path
Labour	Two people for the frame, three or four for the cover
Typical build time	Two dry days after the site is prepared

Safety checks

- Check for buried power, water, gas, drainage and communications lines before driving pins or anchors.
- Check local planning, zoning, setback and structure rules before ordering materials.
- Wear eye protection, gloves and hearing protection when cutting, drilling or driving steel.
- Deburr and cap every cut metal end. Never leave an exposed rebar point beside a path.
- Use a stable platform for overhead work. Do not stand on the base rail or work in strong wind.
- Ask the film supplier whether treated timber needs a separating tape or compatible barrier.

Drawing 1: General Arrangement



GENERAL ARRANGEMENT | 3,000 W × 4,000 L × ABOUT 2,100 H (mm)

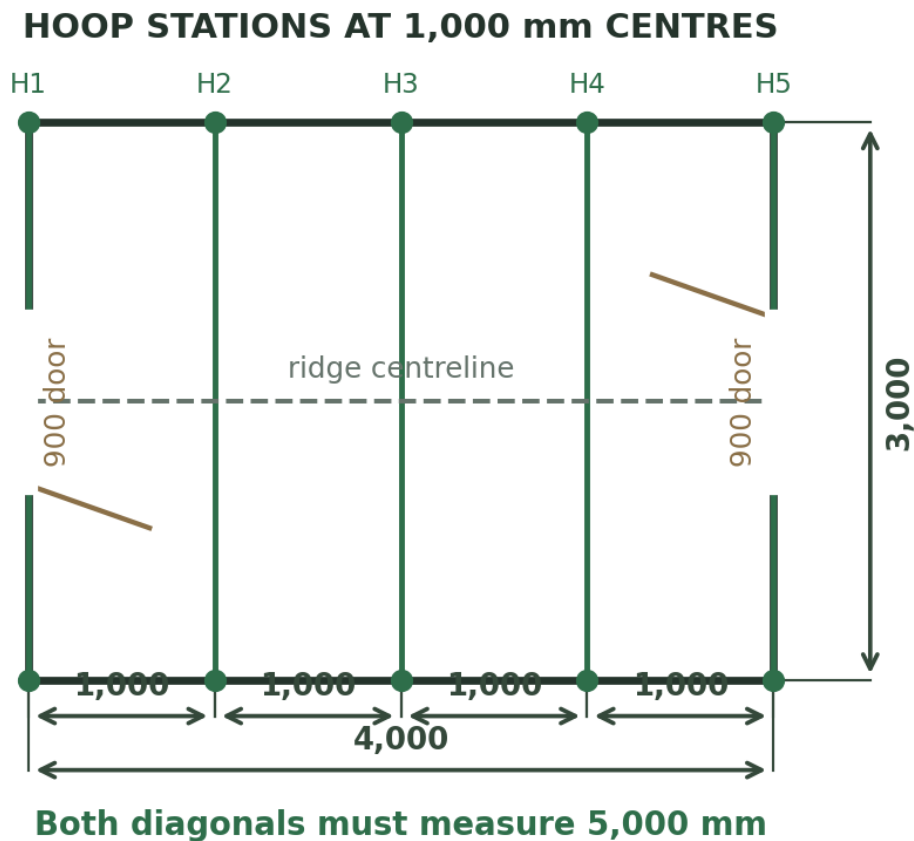
Dimensions are nominal. Dry-fit one hoop before cutting doors or cover material.

Ref.	Part	Purpose
A	40 mm flexible PE hoop	Forms the curved roof and sides
B	47 × 150 base rail	Keeps the footprint square and grips the cover
C	47 × 50 ridge pole	Connects all five hoops at the crown
D	47 × 50 side purlin	Reduces sideways movement between hoops
E	75 × 50 end frame	Carries each door and braces the end bay
F	16 × 900 ground pin	Locates each hoop in firm soil
G	Screw earth anchor and strap	Holds the timber base against uplift
H	Greenhouse film and battens	Forms the weather cover

Why 40 mm PE pipe?

It bends without a hoop bender, it will not rust and it avoids the sharp joins found in many improvised frames. Use UV-stable black PE water pipe or another pipe whose maker approves long-term outdoor exposure. Do not swap in thin electrical conduit without checking its bend radius and outdoor rating.

Drawing 2: Site Set-Out



Choose and prepare the site

1. Choose open light with shelter from the strongest wind. Leave at least 600 mm around the sides for cover repairs and vegetation control.
2. Avoid hollows and ground that stays wet. If the natural slope exceeds 5 percent, move the tunnel or prepare a stable level pad.
3. Mark a 4,000 × 3,000 mm rectangle with four stakes and string. Measure from one fixed corner so small errors do not accumulate.
4. Measure both diagonals. Each must be 5,000 mm. Move the corner stakes until the two readings match within 10 mm.
5. Mark hoop stations at 0, 1,000, 2,000, 3,000 and 4,000 mm on both long sides. Opposing marks must align across the 3,000 mm width.
6. Remove turf and sharp debris beneath the base rails. Grade the surrounding soil so roof runoff moves away from the timber rather than pooling beside it.

Materials and Cut List

Buy structural timber graded for outdoor use. Seal every fresh cut with a preservative that is compatible with greenhouse film.

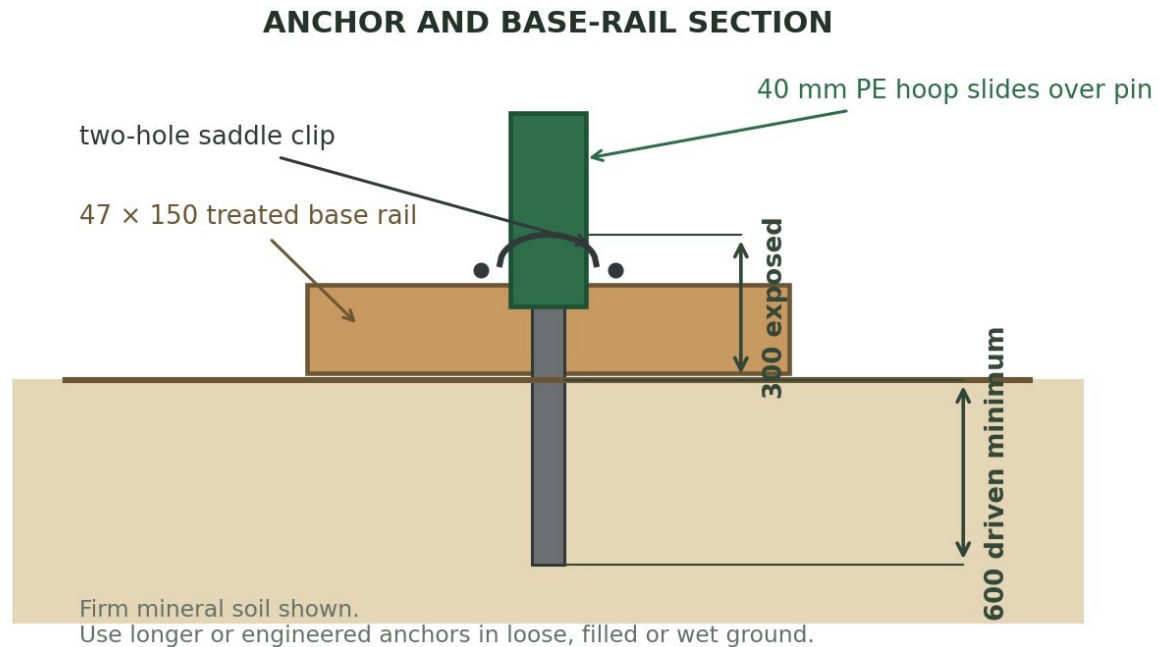
Material	Finished size / length	Qty.	Notes
UV-stable PE pipe	40 mm OD × 6,000	5	One piece per hoop
Ground pins	16 mm × 900	10	Galvanised rod or deburred rebar
Base rails	47 × 150 × 4,000	2	Treated timber
Base rails	47 × 150 × 3,000	2	Treated timber
Ridge pole	47 × 50 × 4,000	1	Straight timber
Side purlins	47 × 50 × 4,000	2	One each side
Door-frame posts	75 × 50 × 2,100	4	Trim tops to fit hoop
Door-frame heads	75 × 50 × 1,050	2	Cut after checking opening
End-bay braces	47 × 50 × 1,400	4	Cut to fit
Door stiles	47 × 50 × 1,880	4	Two per door
Door rails	47 × 50 × 786	6	Three per door, outer width 880
Door diagonals	47 × 25, cut to fit	2	Rise from hinge side
Cover battens	25 × 38	30 m	Pre-drill before fixing

Cover and hardware

Item	Quantity
180 to 200 micron UV greenhouse film, main roof sheet	At least 7.0 × 6.0 m
Greenhouse film for both end walls and doors	One 7.0 × 3.0 m sheet or equivalent offcuts
40 mm galvanised two-hole saddle straps	30
Exterior screws	200 at 5 × 60 mm, plus 40 at 6 × 100 mm
Screw earth anchors with eyes, matched to soil	6 minimum
Galvanised straps or rated cable for anchors	6
Door hardware	6 hinges, 2 latches, 4 handles, 2 hold-open hooks
Greenhouse repair tape and protective frame tape	1 roll each

Order film after the bare frame has been measured. Suppliers use different roll widths and fixing allowances.

Stage 1: Build and Anchor the Timber Base

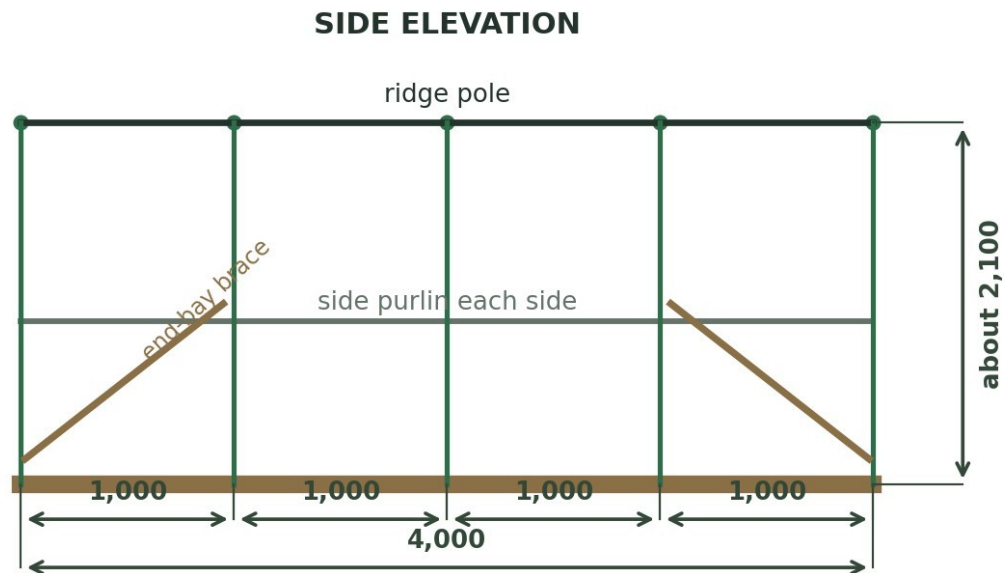


1. Lay the two 4,000 mm rails and two 3,000 mm rails on the string lines. Join each corner with two 6 × 100 mm exterior screws driven into pre-drilled holes. Add galvanised angle plates inside the corners if the timber tends to twist.
2. Check the outer dimensions and both 5,000 mm diagonals again. Pack low points with compacted gravel. Do not pull a crooked base square with the hoop pipes.
3. Mark the five hoop stations on both long rails. Drive one 900 mm pin at every mark, just inside the rail. Leave about 300 mm above ground and at least 600 mm in firm soil.
4. Keep every pin plumb and aligned. Slide a short offcut of hoop pipe over each one while driving to confirm that damaged or mushroomed ends have not made the fit too tight.
5. Install screw earth anchors at all four corners and midway along both long sides. Position each eye close to the base rail, then connect it with a short galvanised strap or rated cable.
6. Pull hard on each anchor. If the soil moves or the anchor rotates without biting, stop and use a longer anchor, a plate anchor or a concrete footing suited to the site.

Do not guess in weak ground

Rebar pins locate the hoops. The earth anchors resist uplift. In soft, wet or filled soil, neither part has a reliable capacity without a site-specific anchor choice.

Stage 2: Raise the Hoops



1. Mark the centre of every 6,000 mm pipe. Mark 300 mm from both ends too. These marks show when the pipe is fully seated on the pins.
2. With one person on each side, slide the first pipe over an opposing pair of pins. Lower both ends together. Stop if the pipe kinks, whitens or develops a flat spot.
3. Secure each pipe to the inside face of the base rail with a 40 mm two-hole saddle strap. Use two screws per strap. The pipe stays over the pin and the strap stops it climbing.
4. Raise the remaining four hoops. Sight along the tunnel from each end. Adjust any leaning hoop before the ridge pole connects the frame.
5. Support the hoops with temporary cords or timber props until the ridge and side purlins are fixed. A row of unbraced hoops can fold sideways in a light gust.

Dry-fit height before cutting the doors

Flexible pipe does not form a perfect mathematical arch. Pipe stiffness, temperature and pin spacing alter the crown. The target ridge is about 2,100 mm, but a finished height between 2,000 and 2,200 mm is acceptable if all hoops match. If the first hoop is much lower, confirm that the pipe is 6,000 mm long and the pin spacing is 3,000 mm before going further.

Stage 3: Add the Ridge, Purlins and Braces

HOOP-TO-TIMBER CONNECTIONS

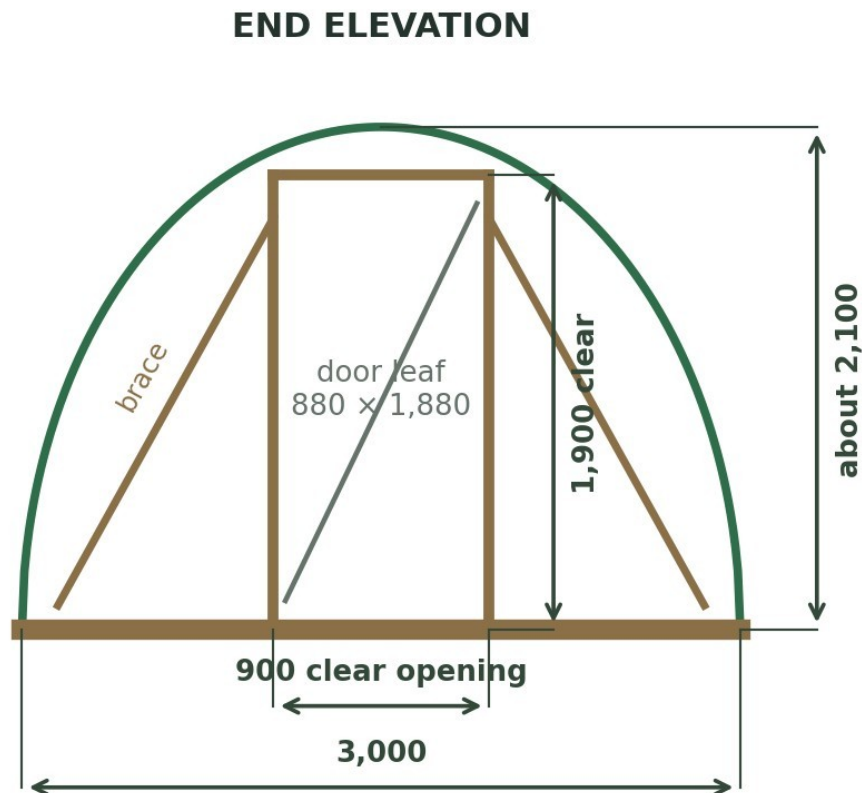


1. Hold the 4,000 mm ridge pole under the marked centre of the first and last hoop. Clamp it in place. Check that it follows the tunnel centreline.
2. Fix the ridge to each hoop with a galvanised saddle strap or perforated pipe strap. Drive screws into the timber only. A screw through the pipe creates a weak point and a sharp edge near the cover.
3. Fit one 4,000 mm side purlin inside each side of the tunnel, about 950 mm above the base rail. Keep both rails at the same height and strap them to all five hoops.
4. Recheck every hoop for plumb. The frame should now behave as one unit when you push it lightly at shoulder height.
5. Fit a diagonal timber brace in each end bay on both sides. Run each brace from low on the end base rail to the side purlin near the second hoop. Cut the ends to sit flat and use two screws at each fixing.
6. Round timber corners, remove protruding screw tips and cover every rough metal contact point with protective frame tape.

Connection check

Tighten straps until the pipe cannot slide by hand. Stop before the strap crushes or dents the pipe.

Stage 4: Build the End Frames



1. Mark the centre of each 3,000 mm end rail. Set the inside faces of the door posts 450 mm either side of that mark to create a 900 mm clear opening.
2. Cut the two 75 × 50 posts long, stand them plumb and clamp them to the end rail. Trim the top ends only after offering them to the hoop.
3. Fit the door header at 1,900 mm clear height. Use exterior screws through the posts into the header, then add metal angle plates if the joint can rack by hand.
4. Strap each post top to the end hoop. Add one diagonal brace on each side of the door, rising from near the base corner toward the door post.
5. Measure the opening at the top, middle and bottom. Correct any difference greater than 5 mm before building the door leaf.
6. Repeat at the far end. Sight through the two openings so both doors line up with the future central path.

End-wall film support

Add short 47 × 50 noggins wherever the end-wall film would otherwise span more than about 600 mm without support. Keep each timber face flush with the door-frame face. The film needs a flat line for its clamping battens, especially around the curved hoop and door corners.

Stage 5: Make and Hang the Two Doors

Door part	Cut size	Per door
Stiles	47 × 50 × 1,880 mm	2
Top, middle and bottom rails	47 × 50 × 786 mm	3
Diagonal brace	47 × 25, mark and cut to fit	1
Finished leaf	About 880 × 1,880 mm	1

1. Build each leaf flat on a level surface. Put the rails between the stiles and check both diagonals. Adjust the frame until the readings match.
2. Pre-drill and screw every joint. Fit the diagonal brace from the lower hinge corner to the upper latch corner so the door weight bears back toward the hinges.
3. Cover the leaf with greenhouse film or insect mesh. Clamp it with narrow battens. Fold sharp corners inward and keep fasteners away from the outer edge.
4. Hang each leaf with three exterior hinges. Aim for an even 8 to 10 mm clearance at the sides and top, plus enough bottom clearance for wet-season ground movement.
5. Fit handles inside and outside, a positive latch and a hold-open hook. Test the latch by shaking the closed door from both sides.

Door swing

Open each door fully before the cover goes on. Move water barrels, pots and path edging now. Later, the plastic will make small frame changes more awkward.

Ventilation choice

Two full doors give the simplest through-flow. On hot days, hook both open. If rabbits, birds or pets are a problem, fit removable mesh panels inside the door openings so air can pass while the tunnel remains screened.

Stage 6: Fit the Main Cover

Wait for the right day

Choose a dry, calm and mild day. Cold film is stiff. Hot film can be stretched too far. Three or four people make this job safer and produce a more even result.

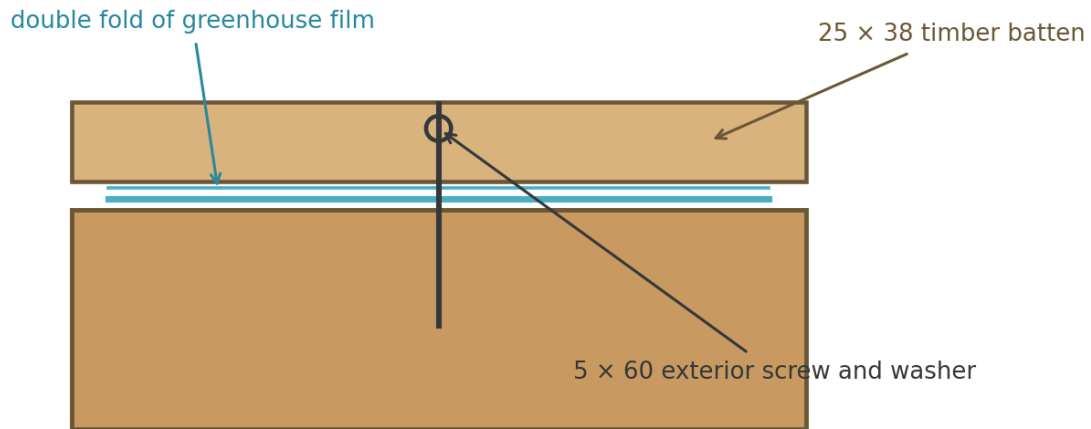
1. Clear tools, wire offcuts, splinters and sharp stones from the frame and ground. Fit protective tape over ridge, hoop and end-frame contact points.
2. Unroll the film on a clean sheet or mown grass. Confirm the outside face if the film maker specifies one. Mark the centre of both long edges with low-tack tape.
3. Carry the sheet over the frame. Do not drag it. Match the centre marks to the ridge and leave equal spare film at both ends.
4. Place temporary film clips on the centre hoop, then on the two end hoops. Pull across the width first. Remove broad wrinkles without stretching the film hard.
5. Clamp the middle 1 m of one long base rail with a pre-drilled batten. Move to the opposite side and clamp the matching section under firm, even tension.
6. Work from the middle toward both ends in 500 to 1,000 mm sections, alternating sides. Check the ridge line after every pair of battens.
7. Stop at the end hoops. Leave the end excess untrimmed until both end walls are fixed and the doors work.

What taut should feel like

The film should stay quiet when you tap it and it should not sag between hoops. A shallow hand press should still move it a little. Drum-tight film places high stress at clamps and corners. Broad loose folds invite flapping, which wears the plastic surprisingly fast.

Stage 7: Clamp the Film and Close the Ends

COVER CLAMPING DETAIL



Pre-drill the batten. Tighten in stages so the film is gripped, not cut.

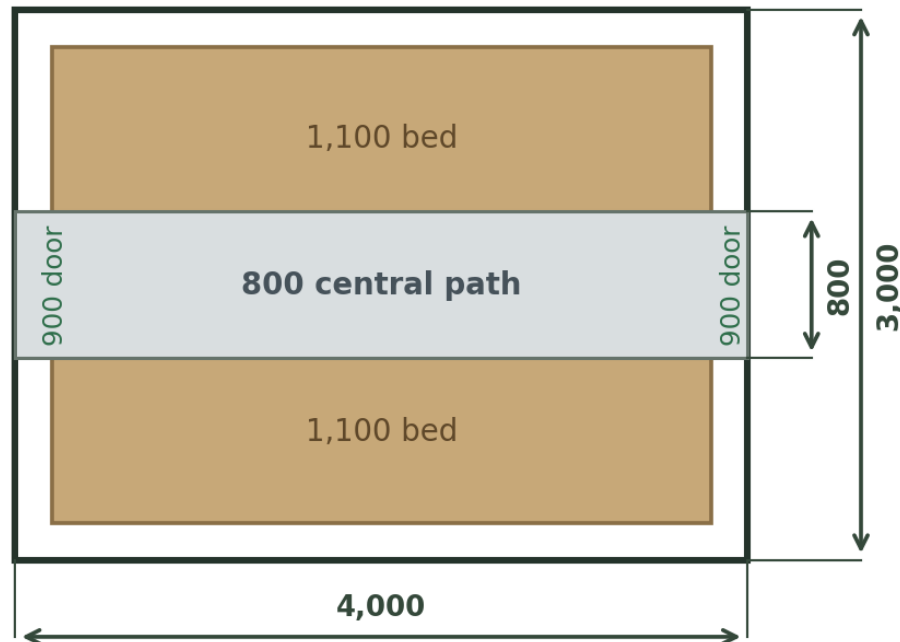
1. Fold the film edge once to create a doubled strip beneath each base batten. Keep the fold straight and free of grit.
2. Pre-drill every batten. Start screws about 75 mm from each end and space the rest about 150 mm apart. Use washers and tighten until the film cannot slip.
3. Drape a separate sheet over the first end wall. Start at the door header, work upward to the hoop and then move down both sides. Form small, flat pleats rather than one thick bundle.
4. Clamp the end sheet to timber with battens. Around the curved hoop, use approved greenhouse-film clips or a supplier fixing track. Do not place unprotected screws through film into flexible pipe.
5. Cut the door opening only after the end sheet is secure. Leave at least 100 mm of film to turn into the opening and clamp against the inner frame.
6. Repeat at the far end. Close both doors, inspect tension and then trim excess film to a 50 to 75 mm tidy margin beyond the battens.
7. Patch any nick at once with greenhouse repair tape on clean, dry film. Round the patch corners so they do not lift.

Screw spacing is a starting point

If the film or fixing supplier specifies a different batten, rail or fastener pattern, follow that system. Do not copy the 150 mm spacing into a product that was designed for another fixing method.

Stage 8: Lay Out the Interior

SIMPLE INTERIOR LAYOUT



This layout keeps each bed within about 1,100 mm of the path. The 800 mm path takes trays and a normal wheelbarrow, while the 900 mm doors leave useful hand clearance.

1. Mark both bed edges with string. Carry a tray along the full route before fixing boards or edging.
2. In-ground beds preserve width and headroom. Keep any raised-bed sides low and round corners near the film.
3. Use gravel, paving or wood chips for the path. Keep its surface below the doors and timber base.
4. Run drip lines along the beds. Sleeve the supply through an end wall and seal the opening with repair tape.
5. Use the purlins only for light strings and crops. Do not hang shelves, water tanks or heavy baskets from this frame.

Heat and humidity

Clear film heats quickly. Open both doors early and keep the air path clear. If heat remains a problem, add screened vents or a supplier-designed roll-up side rather than cutting loose flaps into the cover.

Final Inspection Before You Plant

Complete this check once on a calm day, then repeat it after the first strong wind and first warm sunny spell.

- ☐ Base remains square: both diagonals measure 5,000 mm within 10 mm.
- ☐ All six earth anchors resist a hard pull and every strap is tight.
- ☐ All ten ground pins are covered by pipe and no sharp end is exposed.
- ☐ Every hoop is strapped to the base, ridge and both side purlins.
- ☐ Four end-bay braces are tight and the frame moves as one unit.
- ☐ No screw tip, wire edge or rough timber touches the film.
- ☐ Cover is firm, evenly tensioned and quiet in a light breeze.
- ☐ Doors swing freely, latch positively and hook open without touching the film.
- ☐ Roof runoff has a clear route away from the base rails.
- ☐ Repair tape, spare screws and one short batten are stored nearby.

Weather plan

Forecast or condition	Action
Strong wind warning	Close and latch doors. Remove loose objects. Check anchors and cover edges before wind arrives.
Severe wind or tropical storm	If it can be done safely well beforehand, remove or roll down the cover. A DIY frame has no tested storm rating.
Wet snow	Brush off small accumulations from outside. Remove the cover before the season if snow load is expected.
Standing water	Open an outlet away from the base. Do not work anchors in saturated soil until it is safe.
Heat	Open both doors early. Add shade cloth above the film when crop temperatures stay too high.

Maintenance and Small Repairs

When	Check
Weekly in the growing season	Door latches, new rubbing points, loose battens, tears and blocked drainage.
After strong wind	End bays, earth-anchor straps, hoop straps and any area that has started flapping.
After a hot spell	Film tension. Warm film may settle and need a small adjustment at the battens.
Every three months	Timber softness, corrosion, strap movement, door sag and weeds touching the cover.
Before winter	Local snow risk, cover-removal plan, spare repair tape and clear runoff routes.
At cover replacement	Round timber edges, replace worn tape and tighten the bare frame before fitting new film.

Fast fault finder

Symptom	Likely cause	Fix
Cover flaps at one bay	Uneven clamp tension or a leaning hoop	Release a short batten section, correct the hoop and retension in small stages.
Door rubs after rain	Timber movement or a shifting base	Check base level and hinge screws. Plane only after the frame is stable.
Frame sways lengthways	Loose ridge or missing end brace	Tighten straps and add or replace the diagonal brace.
Anchor lifts	Soil is too weak or too wet	Unload the frame and install a longer or different anchor suited to the soil.
Tear begins at a corner	Sharp edge or over-tension	Remove the cause, clean the film, patch both sides and ease local tension.

A five-minute repair wins

A pinhole patched on a dry afternoon stays small. A loose flap left through one windy night can turn the same fault into a replacement sheet.

Technical Notes and Sources

Dimension notes

- All drawing dimensions are millimetres unless another unit is shown.
- Timber sizes are nominal finished sizes. Buy the nearest locally stocked structural equivalent and adjust straps or screws to suit.
- The 2,100 mm ridge is approximate because flexible pipe forms a natural curve. Measure the dry-fitted frame before cutting film or end posts.
- The 5,000 mm diagonal is exact for a 3,000 × 4,000 mm rectangle and is the quickest way to confirm a square base.
- This plan assumes firm mineral soil. Anchor type and holding power must be checked at the actual site.

Material notes

Use greenhouse-grade UV-stabilised polyethylene rather than general builders' plastic. A 180 to 200 micron sheet is roughly 7 to 8 mil. The extra thickness does not replace correct tension, smooth contact points or strong edge fixing.

The article recommends drainage, matched anchors, longitudinal bracing, protected film contact points and through-ventilation. Those ideas govern this plan. The dimensions and cut list are a practical home-garden interpretation, so they must still be adjusted for soil, weather and local rules.

Further technical reading

USDA NRCS, High Tunnel System, Code 325, 2026 draft

https://www.nrcs.usda.gov/publications/june-redline-cps/325_nhcp_cps_high_tunnel_system_2026_redline_stakeholder.pdf

Penn State Extension, High Tunnel Production

<https://extension.psu.edu/high-tunnel-production/>

University of Minnesota Extension, Extending the Growing Season

<https://extension.umn.edu/garden-and-home/yard-and-garden/gardening-minnesota/extending-growing-season>

University of Minnesota Extension, High Tunnel Ventilation Guidance

<https://extension.umn.edu/agriculture/specialty-crops/commercial-fruit-production/raspberry-farming/growing-high-tunnel-raspberries>

Build from the ground up

Square the base, prove the anchors, connect the hoops and protect the film. That order gives the tunnel a fair chance when the first rough forecast arrives.