ACTIVEVISTA

CATERPILLAR TUNNEL™

COCOON STANDARD™

4.35M WIDE x 1.5M HOOP SPACING

ASSEMBLY AND INSTRUCTION MANUAL

Cocoon Standard™
4.35m x 1.5m Hoop Spacing Tunnel Kit

Commercial low-tech, moveable season extension tunnel.
1.5m hoop spacing, 4.35m (W) x 2.35m (H) x 7.5m - 40m (L) variants.

Thanks for choosing our purpose designed Caterpillar Tunnel™.

Active Vista's Cocoon Standard Tunnels™ are suitable for upgrading to:

- 4.35m wide Cocoon Pro™ variants

If you have any concerns during the build of your ActiveVista Cocoon Standard Tunnel™ system, please contact:

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Component List

Caterpillar Tunnel™ Cocoon Standard™ 4.35m Width Kits Include:

Label	Description	7.5M	10M	15M	20M	25M	30M	40M
A	Hoop Section - Curved side 2360mm x 32mm w/ swaged end, 1.5mm Steel	12	16	22	30	36	42	56
B	Hoop Section - Curved centre 2360mm x 32mm w/o swaged end, 1.5mm Steel	6	8	11	15	18	21	28
C	230m x 5mm UV Poly Rope Spool	0.5	0.5	1	1.5	2	2	3
D	900mm Heavy Duty Star Picket	4	4	4	4	4	4	4
E	Centre Purlin Strap	1	1	1	1	1	1	1
F	180µm Greenhouse Film Roll in metres (min length)	16	18	23	28	33	38	48
G	Corner Footing Rods - 1000mm x N18 Rebar	4	4	4	4	4	4	4
H	Side Footing Rods - 1000mm x N16 Rebar	8	12	18	26	32	38	52
I	Anchor Plate - 4mm 304 grade Stainless Steel	12	16	22	30	36	42	56
J	Carabiner - 6mm 316 grade Stainless Steel	12	16	22	30	36	42	56
K	Purlin End Clasp - 25mm Clasp and short strap (Marine grade)	2	2	2	2	2	2	2
L	14g x 20mm Self Drilling Screw (5/16' head)	24	32	44	60	72	84	112
M	5/16" Nutsetter Driver for Screws	1	1	1	1	1	1	1
N	Yellow Safety Caps for Star Pickets	4	4	4	4	4	4	4
O	Repair Tape for Greenhouse Film 75mm	1	1	1	1	1	1	1
P	Side Curtain Hook	4	6	6	6	8	8	10

Component Reference Guide

A

B

C

D

E

F

G

H

I

J

K

L

M

N

O

P

Tools Required

A smooth setup starts with the right prep. Make sure you've got the necessary tools sorted before you move onto the assembly.

Required:

- **String Line**
- **Safety glasses** (to be worn by each person)
- **Post driver** or **Sledge hammer**
- **18V Drill** or **Impact Driver**
- **5/16" driver bit** (included)
- **Ladder/s** (with functional safe height to suit this construction process)
- **Tape measure** (5m plus)
- **Long tape measure** (longer than tunnel)
- **Scissors** or **Knife**
- **Marker pen**

Recommended:

- **Hacksaw**
- **Angle Grinder**
- **Earmuffs**
- **Pliers**
- **Post puller**
- **Spirit Level**

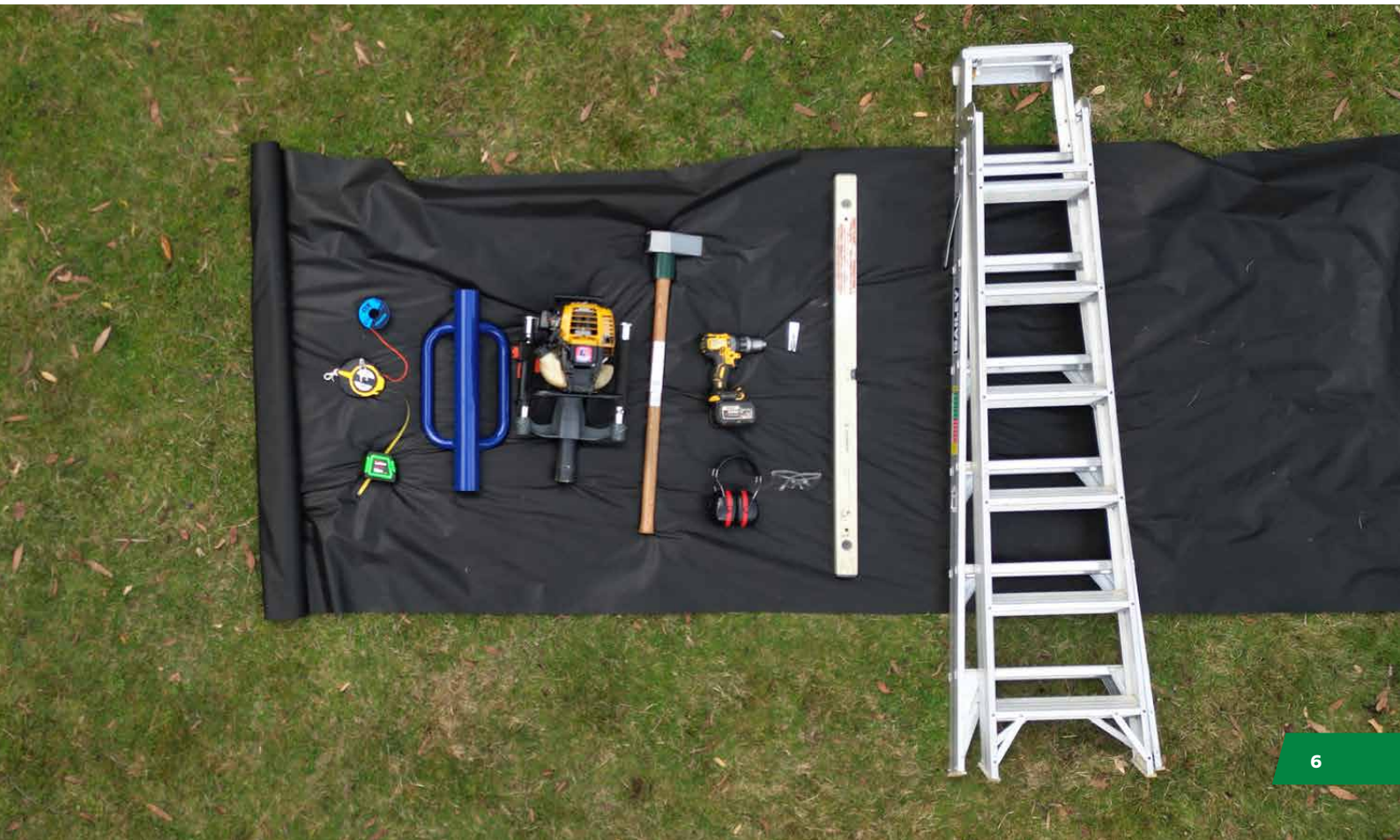


DIAGRAM 1 – Tunnel and Diagonal Length

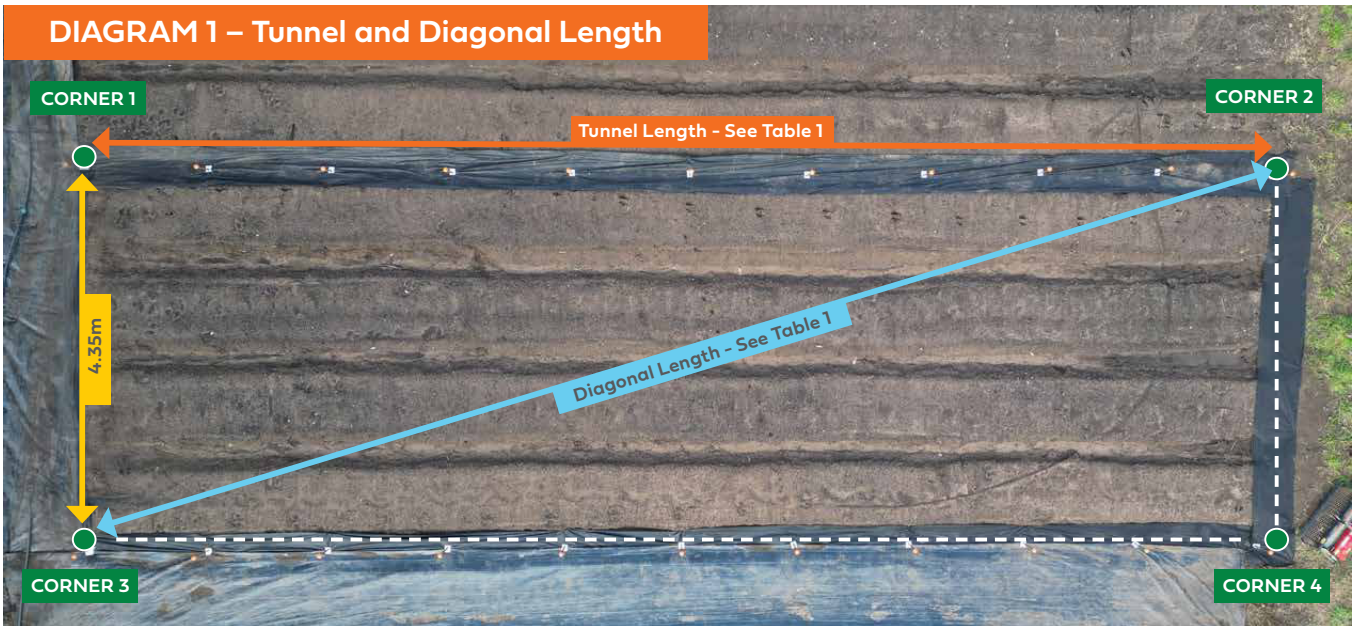


TABLE 1 – Diagonal Measurements *(Inc Adjustments if Length Option Added)*

No. of Hoops	Tunnel Length Corners 1–2	Diagonal, Corners 2–3 (4.35m Width)
6	7.5m	8,670mm
8	10m / (10.5m)	10,905mm (11,365mm)
11	15m	15,618mm
15	20m / (21m)	20,467mm (20,956mm)
18	25m / (25.5m)	25,367mm (25,860mm)
21	30m	30,313mm
28	40m / (40.5m)	40,235mm (40,732mm)

STEP 1

Footing Rod Installation

Parts Required: G H

Step 1A

Locate one corner tunnel position* and drive one of the **Star-Lock Kit N18 (18mm wide) Footing Rods (G)** into **Corner 1***. Leave approximately ***350mm*** of **Rod (G)** above ground level. Measure the tunnel length, insert another **N18 Footing Rod (G)** into **Corner 2***.

Attach a string line from **Corner 1*** to **Corner 2*** at ground level. Drive in **N16 Footing Rods (H)** ***every 1.5m*** along the string (or as required - ***See Table 2***), measuring every next position from **Corner 1*** to avoid error creep.

Tool suggestions for driving in footing rods include, **A** - Manual post rammer, **B** - Sledge hammer or **C** - Motorised post rammer ***(see image: Step 1A - Suggested Tools).***

Note:

1. The tunnel width can be widened or narrowed, from 4.8m to 5m depending on your preference.
2. **If using 75cm beds, 45cm paths (1.2m centres) format: 4.35m width:** corner position is ***5cm further out*** from mid path before bed 1 and ***5cm after*** mid path beyond bed 4.

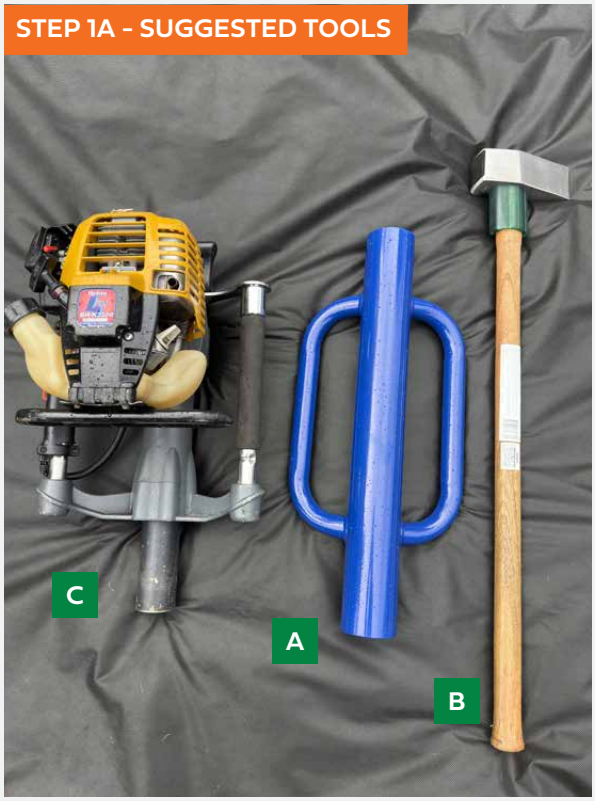
Step 1B

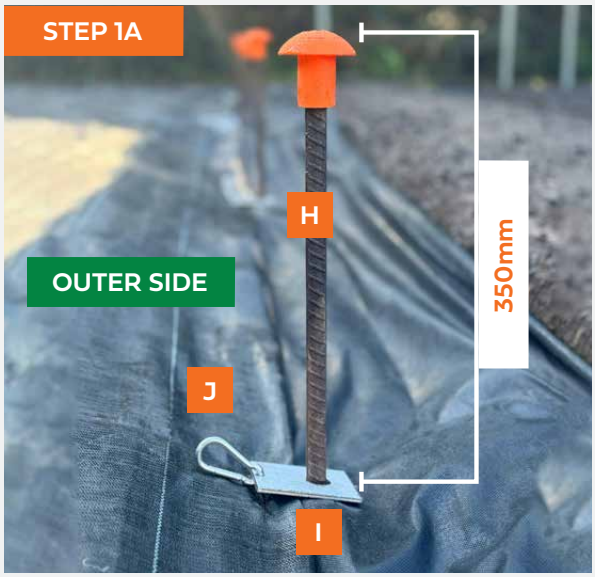
Measure ***4.35 metres*** from **Corner 1*** to the **Corner 3*** area and for accuracy measure the corresponding diagonal distance from **Corner 2*** ***shown in Table 1***. Position **Corner 3*** where the 4.35m and diagonal measurements ***intersect***.

Step 1C

Measure the tunnel length distance from **Corner 3*** to the **Corner 4*** area. Measure ***4.35 metres*** from **Corner 2*** to **Corner 4*** and position the last **Footing Rod (G)** where the tunnel length and width points ***intersect***. Drive the remaining **Side Footing Rods (H)** ***every 1.5m*** between **Corners 3* and 4*** as shown in Step 1A.

*SEE SPECIAL NOTE 1 & 2 ON PAGE 22





STEP 2

Anchor Plate and Carabiner Installation

Parts Required: G H

Step 2A – Star-Lock Anchor Kit Option

If you have purchased the Star-Lock Kit, please follow the instructions provided with it.

Step 2B – Standard Anchor Plate System

Attach a **Carabiner (J)** to each of the **Standard Anchor Plates (I)** with the ***latch facing outwards***. Position the Standard Anchor Plates (I) over the footing rods with **Carabiners (J)** facing away from the inner tunnel ***(see Diagram 2 below).***

DIAGRAM 2

STEP 3
Hoop Assembly

Including prefitting Brace Bands and Side Curtain Hooks

Parts Required: A B P

Step 3A

It is important to join all **Hoop Sections (A/B)** on a flat surface to avoid warps in the hoop.

Step 3B

All **Hoop Sections (A/B)** are joined by placing the swaged end of the section into the unswaged reciprocal piece. The two pieces must be slid together the whole way so that no additional space is left at the end of the swage. If required, have a 2nd person to slightly rotate the other end of the hoop while you push together. This tight fit provides strength against long term vibration from winds affecting the **Joining Screws (L)** *(see image: Step 3B/C).*

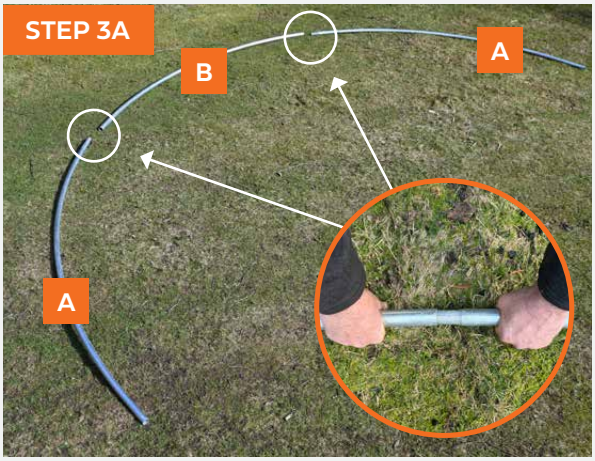
Step 3C

Add 2 x **14g Hex Head Screws (L)** to the join from the overhead position approximately 45mm apart. The first should be set back about 10mm from the steel join, ensuring both are going through the adjoined **Hoop Sections (A/B)** *(see image: Step 3B/C).*

Step 3D – Attaching Brace Bands to Hoops
(Wind Bracing option only)

Brace Bands are used to adjoin **Wind Bracing Poles** to **Hoops**. Preattaching brace bands makes the job easier ***(see image: Step 3D).*** Ensure Screw hole position is facing inwards away from film.

There are two **Brace Bands** used for every **bracing pole** included in Wind Bracing Kits. Please see the ***Wind Bracing Kit guide*** for full instructions. If adding the Wind Bracing Kit option, add **Brace Bands** to the **Side Hoop** Sections of your first 3 hoops from either end as per Wind Bracing Kit Guide.



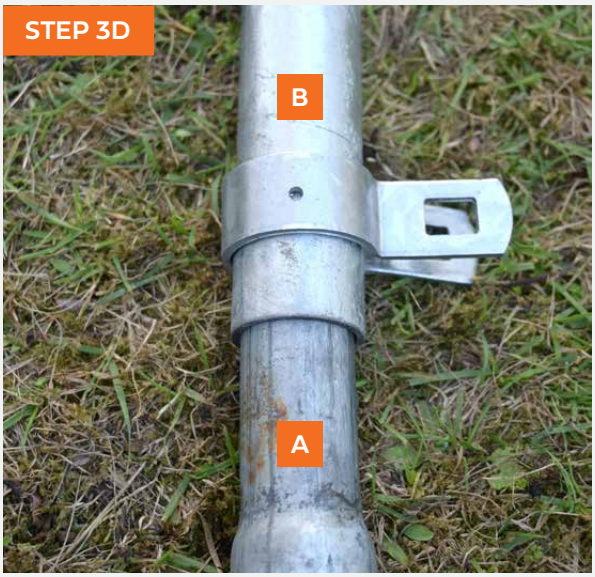


TABLE 2 - Prefitting Brace Bands Configuration Guide

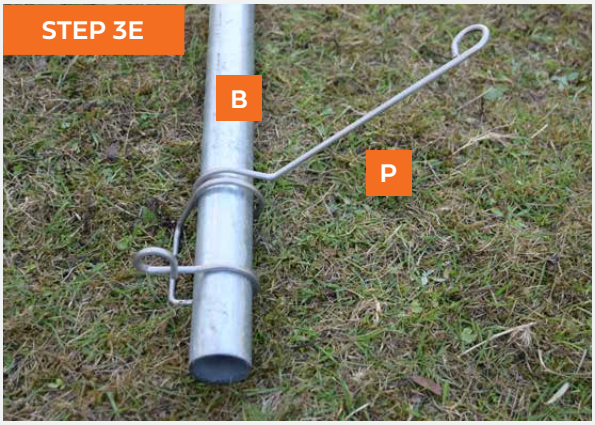
Cocoon Standard	1st Hoop *(Tunnel Ends)*	2nd Hoop	3rd Hoop	All Other Hoops
Without Wind Bracing	N/A	N/A	N/A	N/A
With Wind Bracing	2 (1 each side)	4 (2 each side)	2 (1 each side)	NIL

Step 3E

Attach **Side Curtain Hooks (P)** to your preferred hoops by sliding onto the base of the **Side Hoop Section (A)** *(see image Step 3E)*.

See Table 3 on following page, for suggested Side Curtain Hook placement for the length of your tunnel.

When placing Side Curtain Hook, please ensure it is the correct way up ***(see images: outside/inside curtain hook placement).***



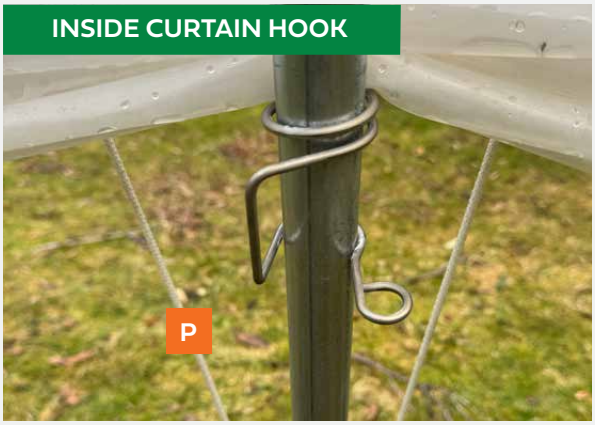
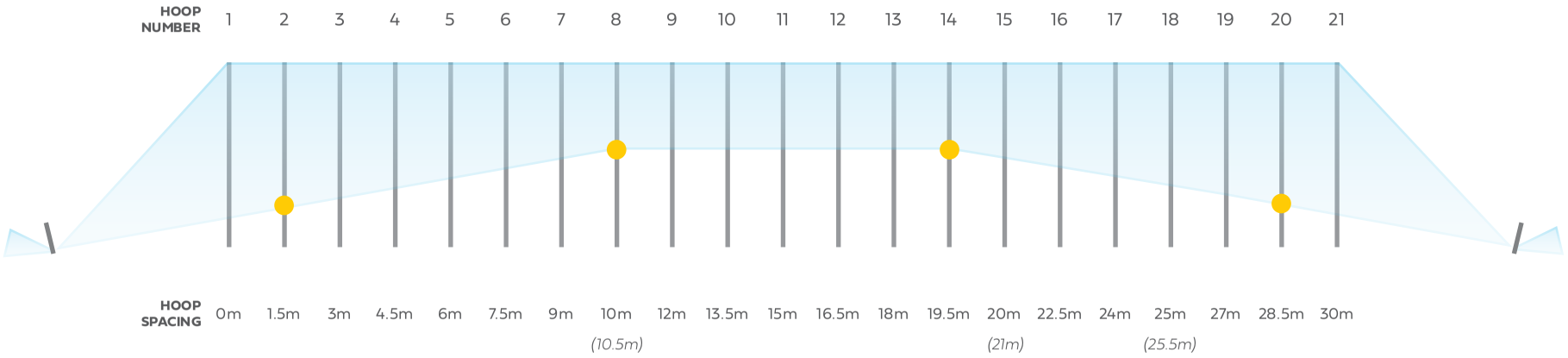


Table 3 - Side Curtain Hook Placement – 1.5m Hoop Spacing

Coloured circles indicate hoops with side curtain hooks.

TUNNEL LENGTH	HOOP NUMBER	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
	HOOP SPACING	0m	1.5m	3m	4.5m	6m	7.5m	9m	10m	12m	13.5m	15m	16.5m	18m	19.5m	20m	22.5m	24m	25m	27m	28.5m	30m
7.5m		●	○	○	○	○	●															
10m		○	●	○	○	○	○	●	○													
15m		●	○	○	○	○	●	○	○	○	○	●										
20m		○	○	●	○	○	○	○	●	○	○	○	○	●	○	○						
25m		●	○	○	○	○	○	●	○	○	○	○	●	○	○	○	○	○	●			
30m		○	●	○	○	○	○	○	●	○	○	○	○	○	●	○	○	○	○	○	●	○

30M TUNNEL EXAMPLE



STEP 4
Hoop Installation

Parts Required: L

Step 4A

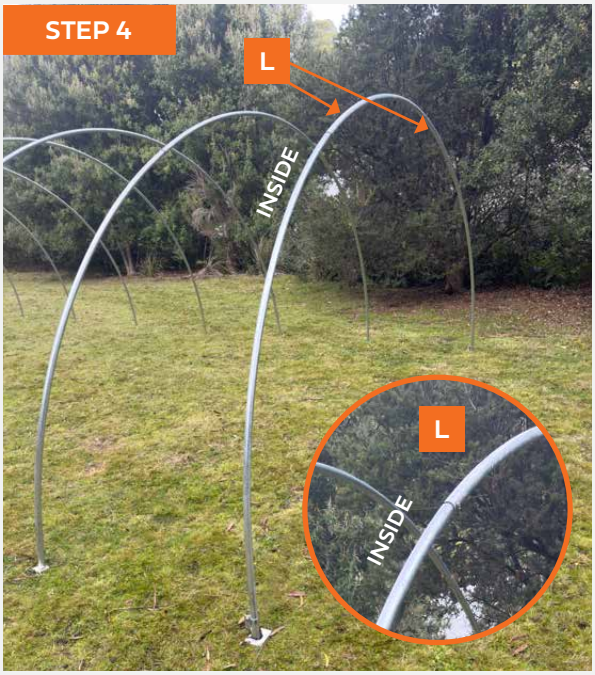
1st Hoop: Place on **Footing Rod** furthest away from completed hoops to enable work flow. Ensure hoop is the correct way around so that **Screws (L)** face *inwards*, to avoid damage to greenhouse film.

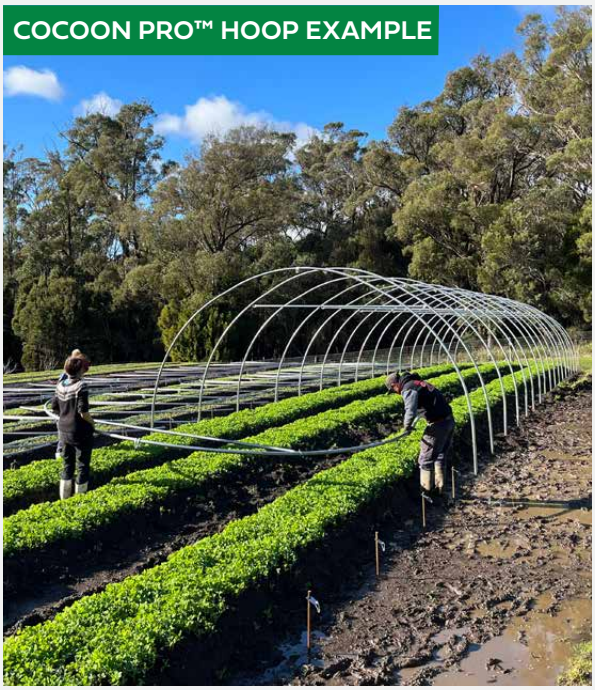
Step 4B

To place hoop on the footing rods: rest one hoop side just on the top of the **Footing Rod** while the other hoop side is flexed in slightly and placed over the **Footing Rod**. Move both hoop sides down together, *incrementally*.

Step 4C

Add remaining hoops and ensure *inwards* position of **Screw Heads (L)** on the final hoop *(see image: Step 4)*.





STEP 5

Purlin Strap Installation

Parts Required: D E K N

Note:

Attach **Yellow Safety Caps to the Star Pickets (N)** directly after positioning to avoid any harm.

Step 5A

Position **Star Pickets (D)** with a hole positioned at ground level for securing **Purlin Strap (E)**. Measure approximately 3m outwards from the centre of the end Hoops and mark the position, this can be optimised by running a string line through the centre position of the tunnel.

Step 5B

Insert **Star Pickets (D)** - On either side of the mark insert the **Star Pickets (D)** on a 45° angle towards the tunnel, allow about 5-7cm between the **Pickets (D)** and leave about 50cm protruding from the ground with one of the holes in the **Picket (D)** at ground level.

Step 5C

Attach the **Purlin Strap End Clasp (K)** to the hole at the base on one of the **Star Pickets (D)** by tying the strap through the hole *(see image: Step 5B/C).*

Step 5D

Attach the long **Purlin Strap (E)** to the **End Clasp (K)** and start looping it over and under each hoop top centre working your way to the **Star Pickets (D)** at the other tunnel end *(see image: Step 5D).*

Step 5E

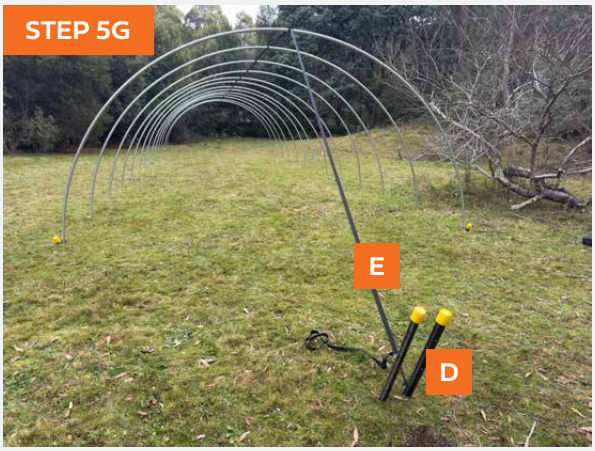
Attach **Purlin Strap (E)** to the 2nd **End Clasp (K)** - First cut the **Strap (E)** shorter leaving about 30-50cm of **Strap (E)** and melt strap end to avoid fraying. Then without over tightening, take up any slack in the **Strap (E)**.

Step 5F

Centre the **Purlin Strap (E)** down the tunnel length while checking that ***all*** hoops are plumb. This task is easier with a friend to stand to the side of the hoop and eyeball the hoop to make sure it is plumb while you centre the **Purlin Strap (E)** and position the hoop.

Step 5G

Tension **Purlin Strap (E)** at both end ensuring there is no slack down the length of the tunnel ***(see image: Step 5G).***



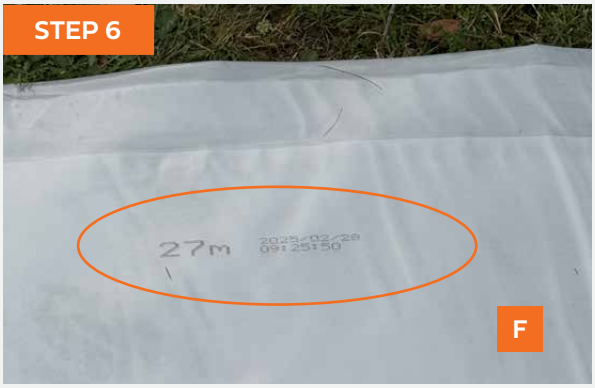
STEP 6

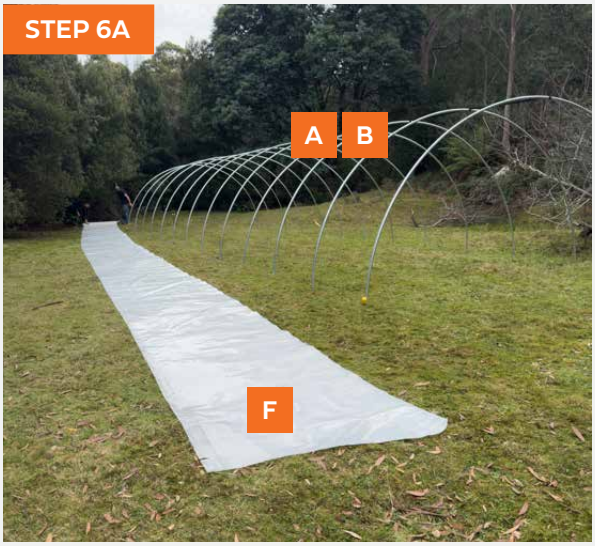
Greenhouse Film Installation

Parts Required: F

Notes:

- **Only attempt if there is NO breeze**. Ensure there are sufficient people for the job. Tunnel to 15m - ideally 4 people +, tunnel to 40m ideally 6 people +.
- To avoid damage take care to not scuff or rub the ends of the roll as it will damage the length of the roll.
- Greenhouse film generally has a top section where the folds meet in the middle. When you start opening the roll make it is facing the correct way for this to occur.
- If the step above is followed the side closest to the tunnel should be the starting edge for lifting over the tunnel.
- UV protection and side facing inwards. Before lifting over the tunnel check that the printed logo or metre numbers can be read the correct way from the inside of the tunnel. This is required for the UV treatment to work. Failure to do so will lead to short film life ***(see image Step 6).***
- Before unrolling the film, consider positioning a ladder in the centre of the tunnel.





Step 6A – Unroll the Greenhouse Film

Position the **Roll (F)** about 1 metre back from the **Star Pickets (D)** (providing 4m of film before reaching the tunnel.

There are various ways to unroll the **Film (F):**

- **1 - Stationary roll:** Place a long handle through the roll's cardboard centre and position between two ladders or similar. This will allow opening out without impacting on the ground
- **2 - Rolling on the ground:** Place weights on the end of the roll and roll out alongside the tunnel, check for debris or sharp/rough objects along the way.

Step 6B

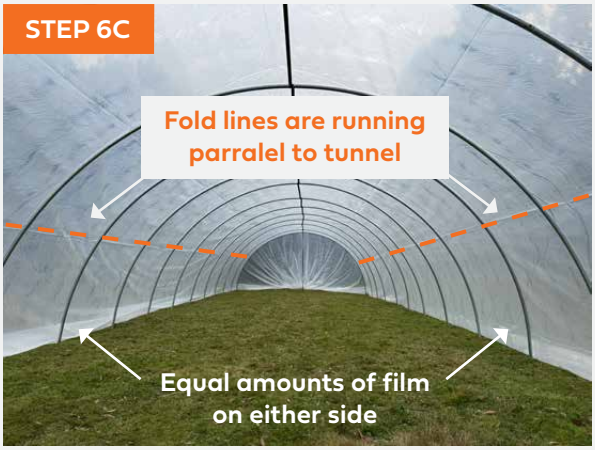
Prepare the **Film (F)** for opening. Tie a small ball sized object in the corner of the **Film (F)** with builders string or thin rope and leave a 8-10m length of rope coming off. For film lengths over 20m consider adding an additional ball and rope on the side's centre ***(see image: Step 6B).***

Step 6C

Lift the two corners ***closest*** to the tunnel and a third person to lift from the centre. Holding the corners securely, start lifting over the tunnel. People at the end positions can use the attached ropes to aid movement across while the central person (and others) can help to unfurl the layers and lift the **Film (F)** up, across the side of the tunnel from the inside position.

Pull the **Film (F)** all the way across and while maintaining grip on each corner and make sure that:

1. Equal amounts of **Film (F)** are at each end of the tunnel (distance past star-pickets)
2. Equal amounts of **Film (F)** are on either side of the tunnel
3. Ensure that the **Film's (F)** fold lines are running parallel to the tunnel ***(see image: Step 6C).***



STEP 7

Tapering and Securing Film Ends

Parts Required: C D

Step 7A

Fold the **Film (F)** at the end into 30cm pleats (like the end of a paper fan) and place between the **Star Pickets (D)**. Using a 2m piece of the tunnel **Rope (C)**, tie the **film (F)** to the **Star Pickets (D)** temporarily so that you can attach the other end tightly *(see images: Steps 7A.1 and 7A.2).*

Step 7B

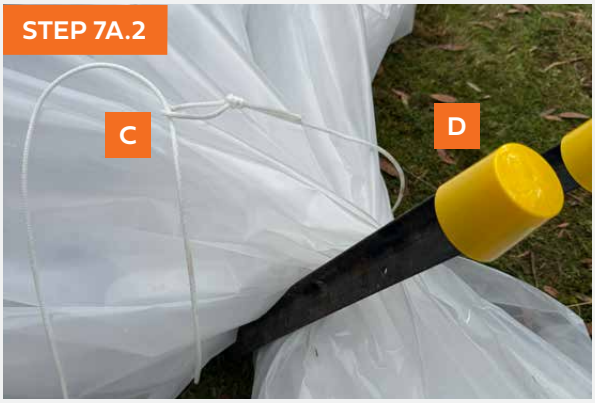
Move to the opposite tunnel end and repeat the folding technique, this time ensuring folds are evenly distributed and pull each part of the fold while watching the tunnel's **Film (F)** tension even out *(see image Step 7B).*

Step 7C

Tie off the end with another 2m piece of **Rope (C)**. Make a loop at one end of the **Rope (C)**, loop it around the tapered **Film (F)** about 30cm on the tunnel side of the **Star Pickets (D)**. Pull the loop tight and thread around the **Star Pickets (D)** and back through the loop, providing leverage to pull tight towards the **Star Pickets (D)**. Use the remaining rope to tie the **Star Pickets (D)** together, sealing in the **Greenhouse Film (F)** *(see image Step 7C).*

Step 7D

Return to the first end, undo the temporary knot and check the pleated folds, re-tensioning as required. Secure the **Film (F)** to the **Star Pickets (D)** with the **Rope (C)** as with the previous end.



STEP 8

Securing Tunnel with Anti-Billow Rope

Parts Required: C

Notes: *(See Diagram 3 page 21)*

1. It is quick and efficient for 2 people to carry out this step.
2. If ropes are loose the film will billow out in high winds, this will lead to tunnel damage.
3. Two options are given, while both work very well, the 2nd is highly recommended.
4. Re-tensioning of new tunnels is recommended after ***2 weeks*** and then ***after 3 months.*** Check ***biannually*** or ***after weather events*** after that.
5. To unroll rope spool, place a rod through the spool and rest each end on chairs, step ladders or similar ***(see image: Step 8 - Note 5).***
6. Meter out rope ***before*** throwing over tunnel. About ***9-11 arm lengths*** of looped rope is sufficient to reach over the tunnel (Cocoon Standard™) for the person's access on the other side ***(see image Step 8 - Note 6).***
7. When tensioning ropes, pull hard enough to ***feel tightness*** in the film and ensure ***evenness*** of tension down the tunnel's length.

Step 8A – Option 1: Zig Zag

Two rope sections to cover the length of the tunnel. Suggested for use in protected areas and with shorter tunnels.

Step 8A.1

Attach **Rope (C)** to the **Carabiner (J)** at **Point 1** on the base of the **1st Hoop**. Throw across top and attach to **Point 2** on the other side. Repeat this down the tunnel, each person skipping one hoop at a time as they go. Temporarily tie off the rope on the final **Carabiner (J)** position (**Point 3**). Cut the **Rope (C)**.

Step 8A.2

Start the opposite side, tying at the **Carabiner (J)** from the first hoop **(Point 5)**. Continue steps as before, tying off on the final **Carabiner (J)** at **Point 6**.

Step 8A.3

Tension the **Ropes (C)** - Starting at **Position 2**, pull down from the right hand side (closest to the start position). Next the person on the other side pulls down on the **Rope (C)** from their left hand side at **Point 3** (taking up the slack from **Point 2** *(see image: Step 8A.3ii).* Continue to the end position and make a tensioning knot *(see image: Step 8A.3iii).* Cut off excess **Rope (C)** and melt end of **Rope (C)** to prevent fraying.

Step 8A.4

Repeat process from **Position 4.**
(See Diagram 3 on following page).

Step 8B – Option 2: 'V' Technique

Rope sections spanning 3 hoops. Suggested for added security and risk reduction.

Step 8B.1

Attach **Rope (C)** to the **Carabiner (J)** at **Point 1** on the first hoop. Throw across top and attach to **Point 2** on the other side. Pass back to **Point 3,** secure to the **Carabiner (J)** and tension section of **Rope (C)** using a tensioning knot. Cut **Rope (C)** and reattach at the same **Carabiner (J) (Point 3).** Repeat this down the tunnel, each person skipping one **Hoop (A/B)** at a time as they go. Tie off the **Rope (C)** on the final **Carabiner (J)** position **(Point 4)** *(see image: Step 8B.1).*

Step 8B.2

Repeat the process from the opposite side of the tunnel starting at **Point 4** *(see Diagram 3B on following page).*

DIAGRAM 3A: ZIG ZAG METHOD

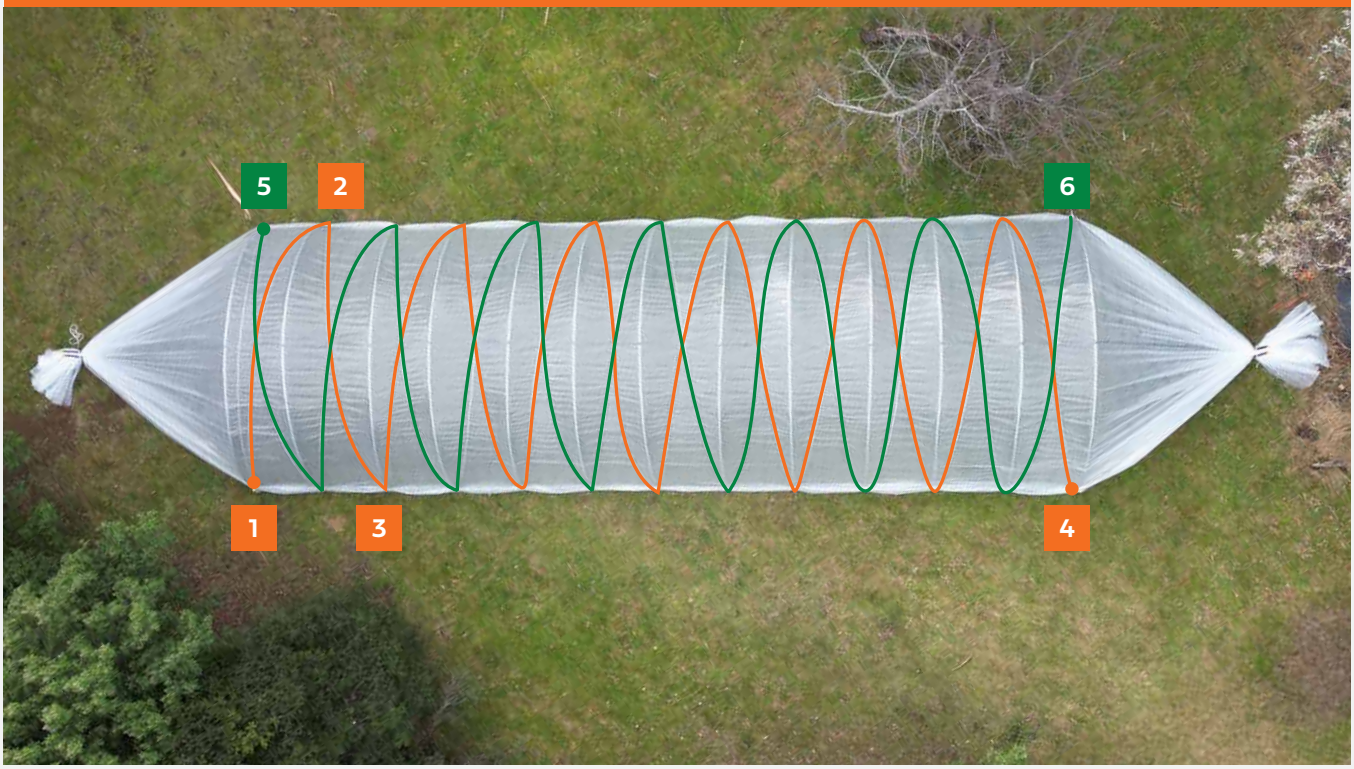
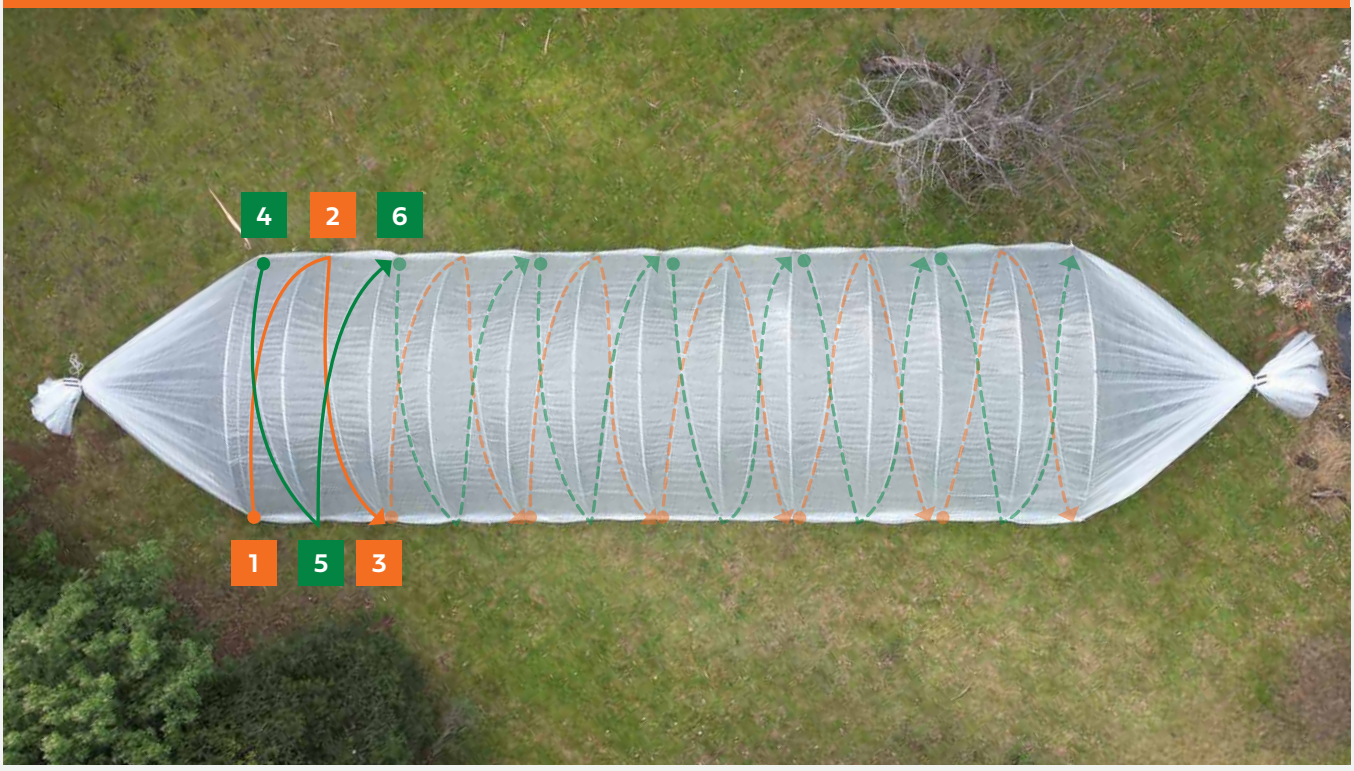


DIAGRAM 3B: 'V' TECHNIQUE



Special Notes

1. Bed Position Consideration

When locating corner tunnel position, consider bed placement.

Depending on tunnel access requirements you may want beds closer or further from tunnel walls. Additionally hoops can be set wider or narrower by +/- 10cm, if doing so recalculate accuracy of corner angles.

2. Adjusting Footing Rod Position

If footing rod strikes a rock, remove and try moving forward or back by 10cm. ***Do not*** measure hoop spacing from the new position. ***Always measure from corner.***

3. Side Curtain Hook Operation

3.1 Side Curtain Hooks can be raised or lowered as required for supporting film. When not required the hook can be turned to face inwards and the film will go back to ground level ***(see image: SN3).***

3.2 Side Curtain Hooks can move past Hex head screws by spinning the side curtain hook with the hex head moving through it.

3.3 Occasionally a variation in hoop steel diameter will loosen the grip of the Side Curtain Hook. In this scenario place a hex head screw at the height you want to use the hook. You can then use as normal.

SN3

4. Tunnel Relocation

The Cocoon Standard™ series are designed for easy movement, with appreciation to regenerative methodology, crop rotation and season extension in mind.

4.1 Seasonal movement: If you are planning semi-regular tunnel movements it may be wise to invest in a 2nd or further set of footing rods. The footing rods can be set-up ready for transferring your tunnel and can also be positioned permanently for future moves. Just add Safety caps (not included) to the tops of the footing rods ***(see image SN4).***

4.2 Greenhouse Film and UV protection: Mark the inside side of your film before removing to ensure your film is facing the correct way when it is repositioned. This will avoid unnecessarily shortening its light transmission and usability.

4.3 Removing Footing Rods is easy with the assistance of a lever. A strap can be tied to a car jack hanging upside down from an A frame ladder for example. If you are often moving or would like to make it very easy try using a Jack Jaw post puller available from our online store.

5. Cocoon Tunnel™ Upgrades

5.1 Your Cocoon Standard Tunnel™ was built with modular versatility in the design. The main components form the Pro version by utilising add-on kits such as; Wind Bracing Kit, Steel Purlin Kit (for centre purlin) and the 400mm Lift Kit.

5.2 Zip-Up End Walls can be added without the Lift Kit Add-on but you will require Centre Purlin and Wind Bracing.

SN4

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