

Mobile Green Wall with Fleece Pockets



Figure 1: Indoor vertical greening with fleece pockets

Key Data

- LOCATION: Indoor, mobile (rollable)
- TYPE OF GREENING: Vertical greening, fleece pockets
- VEGETATION: Indoor plants
- CONSTRUCTION: Trough with back wall (wood) on castors and plant pockets (fleece)
- IRRIGATION: Drip line (automated) or manual pouring

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Location Selection

- Define the surface area and height of the installation site
- Determine the maximum dimensions (L/W/H) of the potentially planned indoor route
 - From assembly location → to final installation site
 - For potential relocation
 - ▣ **Relevant for the maximum size of the greening system**
- Assess orientation and lighting conditions (indoors)
 - ▣ **For plant selection and potential supplementary lighting (indoors)**
- Irrigation:
 - Ensure personnel is available for manual watering (also during holidays)
 - Refill the water reservoir (for automated irrigation with pump system)
 - If applicable: water/electricity connection and drainage (for fixed automated irrigation)

Material

For a “Mobile Green Wall with Fleece Pockets” ~**150/150/50 cm** (L/H/D), the following materials are required.

The listed dimensions serve as approximate guidelines for ordering materials and construction planning. It is recommended to create a construction drawing or sketch based on the actual dimensions of the available components or individual sizes.

For the squared timber and boards, it is generally recommended to choose a local, easy-to-work, and durable wood species. The surface should preferably be planed and untreated. For **indoor use**, spruce wood can be used, for example.

The use of reclaimed or leftover wood is also a viable option. With appropriate surface treatment or selective usage (e.g., placing the nicer side facing forward), material can be saved and reused.

Wooden Plant Container

- **Wood Panels and Boards**
 - 1 pc. 27/500/1,500 mm (bottom) – e.g., standard three-layer formwork panel
 - 1 pc. 24/200/1,500 mm (front side) – e.g., construction board
 - 2 pcs. 24/200/410 mm (side parts) – e.g., construction board
- **Squared Timber 50/80**
 - 4 pcs. 1,500 mm (long pieces)
 - 4 pcs. 200 mm (short pieces)
- **Castors**
 - 4 pcs. heavy-duty castors (load capacity >150 kg each) – swivel and lockable
Select castor type according to floor surface
- **Wood Screws** 5/40 mm [d/l] ~ 50 pcs.

Back Wall and Side Panels – Wood

- **Plywood Panel**
 - 1 pc 15/1,500/1,500 mm (back wall) – can also be made from two panels
 - 2 pcs 15/450/720 mm (side panels) – beveled at 45°, see sketch

Vegetation Support Layer

- **Waterproofing for Planter and Back Wall:**
 - Mortar tub made of plastic (~1,350/310 mm)
 - and/or pond liner made of e.g. EPDM ~2,200/2,000 mm (minimum thickness 1 mm)
- **Inspection Pipe, Diameter 5 cm, Length ~25 cm**
 - e.g. drainage pipe (PP) DN 50 + cap
- **Tank Valve** for Drainage (if required)
- **Drainage Layer, Height 5 cm ~30 l** - e.g. expanded clay, clay granulate
- **Geotextile Fleece** – e.g. recycled fleece (500 g/m²)
 - 1 pc 1,480/2,100 mm (protection for liner and water reservoir)
 - 4 pcs 2,000/300 mm (plant pockets)
 - 1 pc 500/1,500 mm (separation fleece)
- **Substrate ~250 l**
 - For indoor use, e.g. lightweight, purely mineral mixture (volcanic rock, perlite, pumice, zeolite)
 - or alternatively potting soil

Automated Irrigation System (with Water Reservoir)

- Power Connection
- Submersible Pump (e.g. for aquariums, minimum delivery height 3 m)
- Supply Pipe (e.g. PE pipe 16 mm or micro-drip supply line)
- Micro-Drip Line (with dripper spacing ~20 cm or less)
- Ground Stakes (for micro-drip line)
- Timer
- Connectors for Micro-Drip Line (T, L, -)
- Fine Mesh Grid 430/1,500 mm (for covering the reservoir)

Plants

- Suitable indoor plants ☑ **Pay attention to light and moisture requirements!**

Tools

- Measuring tape, folding ruler
- Marking square
- Pencil
- Wood saw: circular saw or mitre saw
- Cordless drill/driver + bit set
- Wood drill bits (for pre-drilling screw holes)
- Optional: wood planer
- Sandpaper
- Optional: metal file
- Optional: tin snips (for metal mesh)
- Utility knife
- Staple gun + staples (for wood)
- Scissors (for cutting fleece)
- Garden shears
- Hand trowels
- Watering can

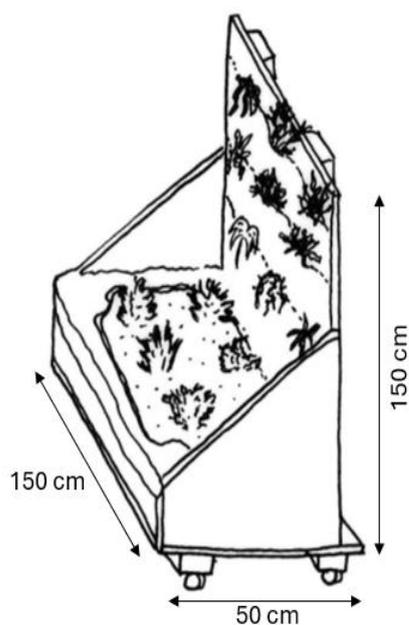


Figure 2: External dimensions of mobile green wall

Step-by-Step

Once all materials have been procured, preparations and assembly can begin.

Step 1: Planning Sketch and Measurements

With the determined total dimensions, a plan sketch can be created and the exact component lengths calculated. It is recommended to prepare a list of all cutting dimensions and drill holes for the wood parts.

Step 2: Assembly of Plant Trough and Back Panel

First, all lengths are marked on the wood ("scored"), then the wood is cut and processed. Afterward, the trough is assembled.

2.1 Cutting and Processing the Wood

1. Transfer all length measurements and drill hole positions onto the wood
2. Cut the wood to exact lengths
3. Bevel or sand the edges
4. Pre-drill the screw holes (distance from the end grain edge > 2 cm)

2.2 Screw Together the Plant Trough



Figure 3: Squared timber and formwork panel (underside)

1. For the underside of the planter box construction, the **formwork panel (27/500/1500 mm)** and two **long square timbers (50/80/1500 mm)** are joined together. The two square timbers should be positioned parallel to each other. Offset the timbers approximately 50 mm inward from the edge of the formwork panel.
2. Draw a line as a marker.
3. Now the **formwork panel** can be screwed to the **square timbers**. The screws are inserted from the top side, i.e., through the formwork panel into the square timbers.
- 4.

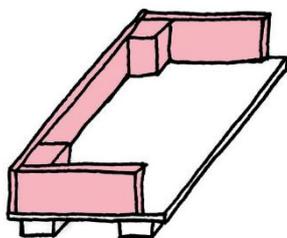


Figure 4: Squared timbers and side sections for plant troughs

5. On the top side, two of the **200 mm long square timbers** are mounted in the front corners of the trough to stabilize the **side panels (boards)**. Position the **square timbers** inward

according to the **thickness** of the **boards** and screw them to the **formwork panel** from underneath.

6. Now the **boards** can be screwed to the edge on the top side of the formwork panel using the **square timbers** (leave one long side open, as the back panel will be mounted there later).

Step 3: Mounting the Back Panel

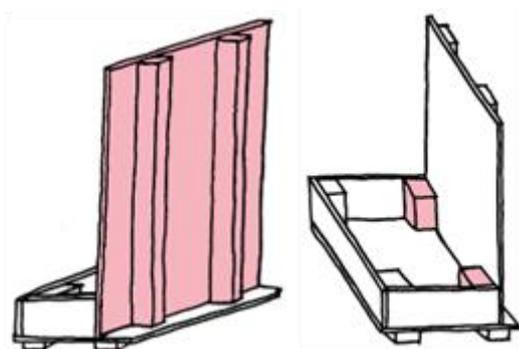


Figure 5: Squared timber and chipboard back panel

1. Two long square timbers (50/80/1500 mm) are screwed onto the back side of the **back panel (chipboard, 15/1500/1500 mm)**. These square timbers should be oriented vertically relative to the base structure (planter box) and spaced approximately 200–300 mm from the outer edges.
 - ☐ If two chipboards are used, they should be arranged on top of each other (i.e., horizontally), not side by side.
2. Now place the **back panel** onto the base structure (planter box) and screw it into the two remaining **200 mm long square timbers** in the rear inner corners of the planter box.
3. To further stabilize the structure, mount the **side panels** on the outer sides. For this, the side panels made of **plywood (15/450/720 mm)** should be beveled at a 45° angle at the top (see sketch). Then align and screw them to the outer sides.

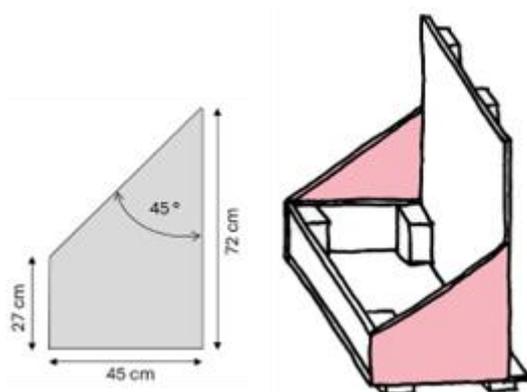


Figure 6: Dimensional sketch and assembly of the side panels

Step 4: Sealing / Lining

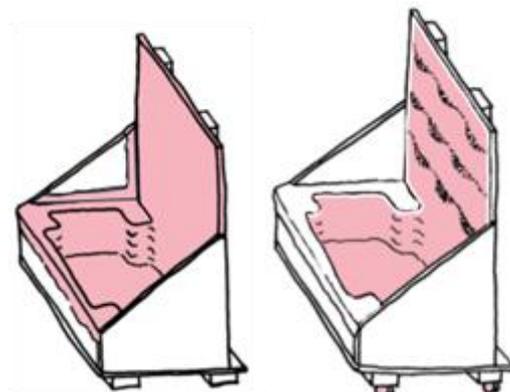


Figure 7: Foil over the edges (left), geotextile at a distance from the edge (right)

1. Insert a suitable **mortar tub** into the planter box (alternatively, use only waterproof lining/foil).
2. For drainage (especially recommended for fixed installations with automated irrigation), drill a hole into the mortar tub and install a **tank valve** either 3 cm above the bottom on the side or on the bottom with a 3 cm internal height (to allow for water retention). Insert and tighten/seal the valve properly.
3. The **pond liner** should cover the entire **back panel** and the inside of the **planter box** (or be guided into the mortar tub if present).
To do this, stretch the **pond liner** from the top of the **back panel** downward only on the inner side, i.e., into the planter box. Pull it over the edges and staple it to the back side using a staple gun.

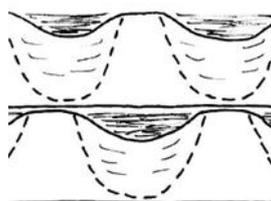


Figure 8: Offsetting the plant pockets

4. The pond liner should also line the inside of the planter box entirely, including over the top edges. Fix the foil to the upper/outside edges with staples.
5. Next, the **geotextile fleece (1,480 x 2,100 mm)** is laid flat over the pond liner on both the back panel and the planter box and stapled into place. The fleece should not cover the edges, but should be offset ~1 cm inward from all edges. This prevents water from wicking over the edge and out of the planter box.
6. In the next step, the **planting pockets** are attached. For this, the **fleece strips (300 x 2,000 mm)** are stapled together in such a way that pockets are formed. The strips can be directly fastened underneath each other, but the pockets should ideally be staggered in their arrangement.
7. Before planting, install the **casters**. These should be screwed into the square timbers of the bottom plate, leaving a 100 mm distance from the edge.

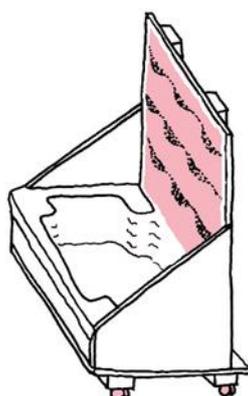


Figure 9: Fleece bags and rolls

Step 5: Filling / Layer Structure of The Plant Trough

If an automated irrigation system is installed, the planter box can also be used as a water reservoir. In this case, the following steps for building up the planter box layers can be skipped. To keep the water clean, it is recommended to install a fine-meshed grid on top of the planter box.

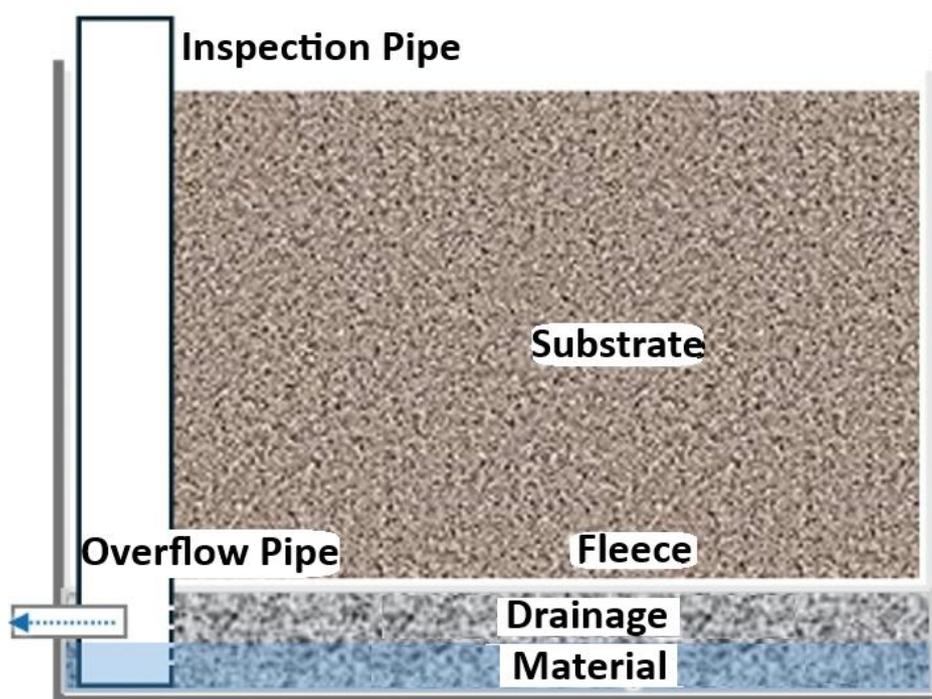


Figure 10: Layer Structure plant trough

The following steps describe the filling process and layer structure of the planter box for planting purposes:

1. Drill many small holes in the lower part of the control pipe and wrap it with geotextile fleece (to prevent material from trickling in).

Then place it upright in the bottom of the planter box (on the overflow pipe/tank valve – if present) and hold it straight.

2. Fill the plant trough with **drainage material** to a height of approx. 5 cm.
3. Cut the **separation fleece (500/1,500 mm)** and cut a hole for the control pipe.
4. Insert the fleece and pull it up along the sides.
5. Fill with **substrate** up to approx. 3 cm below the top edge.

Step 6: Fit an Automated Irrigation System (with Water Reservoir)

An automated irrigation system is – wherever possible – always recommended to ensure consistent watering (including during holidays and student and staff turnover).

The following describes the installation of an irrigation system using a water reservoir and submersible pump. Alternatively, for a fixed location, irrigation can be connected to the house water system with a controller and drainage. Wherever possible, a fixed installation connected to the house system is the most reliable option.

6.1 Install Pump and Controller

1. Position the **submersible pump** inside the water reservoir and connect it to the timer.
2. Mount the **timer**, e.g., on the side, top, or back, and connect it to the power supply using an extension cord or plug it directly into a nearby power outlet.

6.2 Install Lines/Drippers

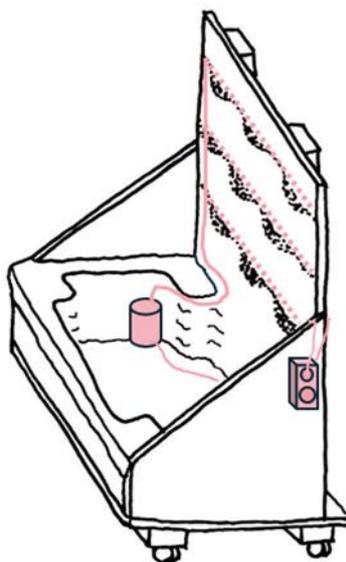


Figure 11: Pump, pipes and timer

1. Connect the **supply line** to the **submersible pump** and run it vertically up the front side of the green wall.
2. At each row of planting pockets, attach a **T-connector** and run a **drip line** horizontally to the last planting pocket. At the very top, use an **L-connector**.
3. Install an end piece at the end of each **horizontal drip line**.
 ☒ **Ground stakes** for fixing the lines are inserted later during the planting process.
4. Check connectors and fittings for **leaks**.
5. Set **irrigation times** and **duration** on the timer:

- a. **Start time / interval:** 1–2x per day
- b. **Duration** per start – depending on dripper output / spacing and pump capacity:
~ 1 to 15 minutes

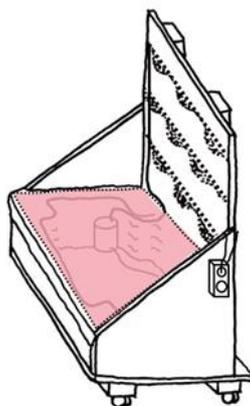


Figure 12: Safety Grid

Step 7: Install Safety Grid

To prevent excessive plant or soil material from entering the water reservoir, a fine-mesh protective grid can be mounted on top of the trough. Excess and refill water can flow back into the trough. The grid should be easily removable for maintenance. It can also be split into two parts, allowing the section above the pump to be easily taken off.

1. Cut **the grid (430/1,500 mm)** to fit the dimensions of the trough and file/smooth the edges.
2. Place the **grid** on top of the trough and secure it with a few screws to the upper edge of the trough.

Step 8: Planting and Filling the Fleece Pockets



Figure 13: Planting

1. First, the plant trough was filled to ensure the construction is stable and won't tip over. Now the **plant pockets** can be partially filled with **substrate**, leaving enough room for the plants' root balls.
2. Now, the plant trough and the pockets can be arranged and **planted**.
3. Remove the **root ball** from the nursery pot and gently score the bottom of the roots (this promotes better rooting).
4. Insert the plants and fill the pockets with **substrate**.
5. Firmly press the **substrate** in by hand all around and continue filling until approximately 3 cm below the top edge.
6. Roll the fully planted green wall room divider to its **designated location** and **water** thoroughly from the top down (the substrate initially absorbs a lot of water).

☑ When watering, the excess water not absorbed by the upper plants will trickle down. This means that the plants in the lower planter require much less water and should be watered sparingly.

Plant Care and Maintenance

- Visual Inspection – daily ☑ Are the plants healthy and is the irrigation system working properly?
- Establishment Care:
 - Water approx. once per day (initially more often with less water). After good root establishment: less frequent (3–7 times per week).
 - Remove brown leaves as needed.
 - Fertilize with slow-release or solid fertilizers.
- Check Water Accumulation and Drainage (~ once a week):
 - Water level in the control pipe: max. ~5 cm
 - ☑ If higher, drain using a hose or pump.
 - If a drainage system is installed – check functionality.
- Pruning and Replanting:
 - Trim brown leaves or overly long shoots as needed.
 - In case of plant loss – remove entire root ball and replace.
- Automated Irrigation System (if available):
 - Refill water reservoir approx. once per week (water demand ~50–70 L/week).
 - Function check of the system.
 - Adjust watering frequency and duration based on need (e.g. summer/winter).
 - Clean pump and reservoir as needed (~ once per year).



Figure 14: Plant care

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