GA-072 Bottom-watering tray lift grate

Lift a matched nursery flat out of a shallow purchased watering pan using a low rigid grate with two handholds.

Controlling dimensions: US inches and feet. Metric equivalents are references. Original editorial design; no physical build, animal trial or load certification is claimed.

Before marking and cutting

Measure the stated stock sections before cutting. Use the cut-list geometry, not scale measurements from the drawing.

US inch dimensions control; millimeter values are rounded conversions. Ordinary cut target ±1/16 in (1.6 mm); fit commercial accessories before boring attachment holes.

Use limits

Original bounded garden component, not an occupied structure.

No human standing, sitting, climbing, lifting or fall protection use. No stated safe working load.

Geometry and fastener quantities are editorially checked; no prototype build, wind test or crop trial is claimed.

Materials and finished cuts

Part	Qty	Size to cut	Material and detail
P01 Long grate rails	2	24 × 1 1/2 × 3/4 in 609.6 × 38.1 × 19.05 mm	1 × 2 in board sound untreated cedar or other durable untreated wood; no unknown salvage
P02 Cross grate slats	5	14 × 1 1/2 × 3/4 in 355.6 × 38.1 × 19.05 mm	1 × 2 in board sound untreated cedar or other durable untreated wood; no unknown salvage
P03 Handhold blocks	2	14 × 2 1/2 × 3/4 in 355.6 × 63.5 × 19.05 mm	1 × 3 in board sound untreated cedar or other durable untreated wood

Hardware and consumables

20 #8 × 1-1/4 in screws for slats, 2 per slat/rail crossing

8 #8 × 1-1/2 in screws for handhold blocks, 4 each

Purchased sound nursery flat and shallow watertight pan; pan clear size >25-1/2 × 14 in

Potable-quality water for edible-crop seedlings; no roof-water produce contact

Tools

Tape measure and steel rule; Pencil, square and clamps; Saw suited to the stated stock; eye and hearing protection; Drill/driver, countersink and bits matched to fasteners; Sandpaper and edge file; gloves when handling cut mesh

Primary context and design record

Context references; not design endorsements or certifications.

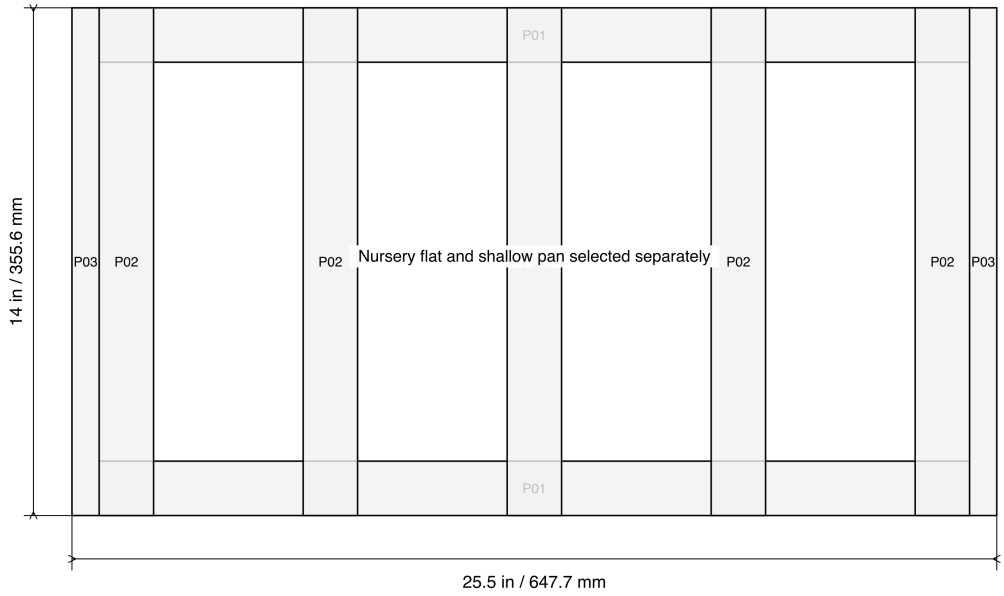
E02 · Seed and Seedling Biology · Penn State Extension · https://extension.psu.edu/seed-and-seedling-biology

E10 · Sowing Annual Seeds · Penn State Extension · https://extension.psu.edu/sowing-annual-seeds

Assembly and first checks

GA-072 Bottom-watering tray lift grate

PLAN — looking down; rear at top; controlling dimensions in inches



Part IDs refer to the finished cut list. Shapes are not load-rated. Read assembly before cutting.
Notches, holes, fittings and operating angles: see numbered steps and geometric annotations.
Original editorial draft • B/W vector • not physically built or tested • no implied Extension endorsement

01 Plan the bottom-watering tray lift grate for this result: Lift a matched nursery flat out of a shallow purchased watering pan using a low rigid grate with two handholds. Confirm the design reference before cutting: Flat fully supported and pan provides hand clearance; no protruding hardware. In the drawings x runs left to right, y runs front to rear and z runs upward.

02 Verify the required stock before laying out these parts: 1 × 2 in board: actual 0.75 × 1.5 in (19.05 × 38.1 mm); 1 × 3 in board: actual 0.75 × 2.5 in (19.05 × 63.5 mm). Reject split or twisted wood and unknown salvage; thinner stock requires recalculating the joints, not simply using the listed lengths.

03 Cut and label the finished parts: 2 Long grate rails 24 × 1.5 × 0.75 in (609.6 × 38.1 × 19.05 mm), mark P01; 5 Cross grate slats 14 × 1.5 × 0.75 in (355.6 × 38.1 × 19.05 mm), mark P02; 2 Handhold blocks 14 × 2.5 × 0.75 in (355.6 × 63.5 × 19.05 mm), mark P03. Keep saw kerf outside each finished line. Rip only where the finished width is narrower than the actual stock; use a suitable guide and target ±1/16 in (1.6 mm) for ordinary cuts. Dowel triples mean length × diameter × diameter, not square dowel stock.

04 Lay the 24 in rails flat at 14 in outside depth. Position cross-slat left faces at 0, 5-5/8, 11-1/4, 16-7/8 and 22-1/2 in.

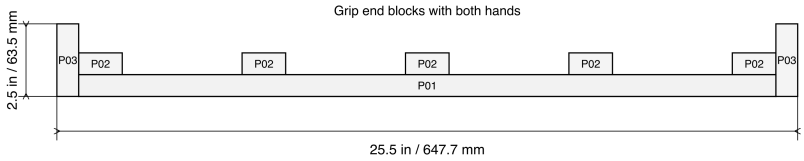
05 Fasten each slat at both rail crossings with two underside/upper-entry 1-1/4 in screws as driver access permits; all points must stay inside the 1-1/2 in stack.

06 Attach the two handhold blocks outside the rail ends at x = -3/4 and 24 in, using four 1-1/2 in screws per block into the rail ends. Stagger screws clear of slat screws.

Complete the assembly

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FRONT — transparent assembly projection from y = 0; controlling dimensions in inches



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Notches, holes, fittings and operating angles: see numbered steps and geometric annotations.
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07 Round the handhold upper edges and sand all flat-contact faces. No handle hole is necessary; grasp the two broad end blocks.

08 Fit the actual empty nursery flat on the grate and the complete grate in its shallow pan. There must be clearance for fingers at both ends and room for controlled vertical removal.

09 Add only a shallow amount of appropriate clean water according to the crop/flat method. The wood grate does not prescribe water depth or duration.

10 Once the media is adequately wetted, lift the grate with both hands and let excess drain over the pan before returning to a supported bench.

11 Do not leave seedlings standing indefinitely in water. Empty/clean the pan and dry the grate after each session; trial the actual planted flat modestly before routine use.

12 Complete the acceptance checks below before putting the assembly into service. Record any changed stock thickness, fastener or equipment fit on the project sheet. The published geometry has not been physically built or load-tested.

Acceptance and intermediate checks

Flat fully supported and pan provides hand clearance; no protruding hardware.

Two-hand lift remains modest and stable; pan is not lifted with the grate.

Operation

No carrying/load rating, automatic irrigation control or guarantee against damping-off.

Cleaning and maintenance

Dry grate immediately, inspect end fasteners and clean pan separately.