

Concrete Base Specification for Heavyweight Sheds

Scope and performance

- **Footprint:** 3.9 m x 9.3 m.
- **Use class:** Heavyweight sheds with concentrated loads (benches, machinery, stacked storage).
- **Design approach:** Thick slab, robust sub-base, reinforcement, crack-control joints, and conservative curing.

Materials and Grades

- **Concrete:** C25/30 ready-mix, slump **S2–S3** for slabs.
- **Reinforcement:**
 - **Mesh:** A193 (7 mm @ 200 mm) minimum
 - **Cover:** 35–40 mm to all faces.
 - **Laps:** 300 mm minimum, wire-tied; support on chairs (BS 7973 practice).
- **Sub-base:** MOT Type 1, well-graded, to **100–150 mm compacted** thickness depending on ground.
- **DPM:** 1200 gauge polythene, lapped **150 mm**, taped, turned up to slab top edge.
- **Formwork:** Straight timber/steel, oiled, braced ≤ 1 m centers.
- **Curing:** Poly sheeting.

Thickness and Reinforcement Strategy

- **Slab thickness:**
 - **Standard heavy-use:** 125 mm.

Site Preparation and Levels

- **Excavation depth:** Typically **150–220 mm** (sub-base + slab + tolerance). Remove topsoil, organic matter, and soft spots.
- **Formation:** Level, well-compacted, with **1:80** fall away.
- **Services check:** Confirm no buried utilities.

Sub-base Installation

- **Placement:** Lay MOT Type 1 in **two lifts**, compact each lift with a vibrating plate/roller to refusal.
- **Thickness:**
 - **Good ground:** 100 - 150mm compacted.
- **Tolerance:** ± 10 mm over a 3 m straightedge.

DPM and Reinforcement

- **DPM:** Over sub-base, lapped and taped, puncture-free, turned up at edges to FFL then trimmed after cure.
- **Mesh:** On chairs; ensure **continuous support**, maintain cover; **suspend mesh mid-depth** (not draped on DPM).
- **Perimeter beam (if used):** Place bars and links per design; ensure anchorage and continuity at corners.

Concrete Placement and Finish

- **Pour plan:** Single pour if feasible; if staged, install **keyed construction joints** with **dowels** (12 mm @ 300–400 mm centers, mid-depth, sleeve one end).
- **Compaction:** Tamp/beam; light vibration to release air and consolidate around reinforcement without over-vibration.
- **Finish:** **light brush** for desired slip resistance. Avoid overworking surface water (laitance).

Joints and Crack Control

- **Construction joints:** Straight, keyed; **dowelled** for load transfer.
- **Edge detailing:** **Chamfer** or eased edges to reduce spalling under traffic.

Curing and Protection

- **Initial cure:** Immediately after finishing: **poly sheeting**; maintain for **7 days** minimum (longer in cold/dry wind).
- **Loading:**
 - **Foot traffic:** 48 hours.
 - **Light loads:** 7 days.
 - **Heavy point loads/machinery:** After **28 days** strength development.

Tolerances and Quality Checks

- **Surface level tolerance:** **±10 mm** over 3 m straightedge.
- **Thickness tolerance:** **-10 mm / +15 mm** from specified.
- **Flatness:** No ponding; falls per design.
- **Records:** Keep delivery tickets (strength class, slump), reinforcement inspection photos, curing logs, joint locations.

Drainage and Moisture Management

- **Falls: 1:80** away from shed perimeter if any part is weather-exposed.
- **Perimeter: Gravel margin** or narrow **French drain** where soils are poorly draining.
- **Moisture barrier:** DPM under slab; match with shed manufacturer's floor damp protection.

Services and futureproofing

- **Conduits:** Install **electrical/data/water** sleeves before pour; mark their locations on an as-built sketch.
- **Thermal:** If shed will be heated, add **perimeter insulation strip** (e.g., 25–50 mm PIR) to reduce thermal bridging.

Quantities (ordering)

- **Slab volume @ 125 mm:**
 - $3.9 \times 0.125 = 4.534 \text{ m}^3$.
 - **Order allowance (+10%): ~4.99 m³.**
- **Sub-base @ 100 mm:**
 - $3.9 \times 5.8 \times 0.100 = 2.262 \text{ m}^3$.
- **Sub-base @ 150 mm:**
 - $3.9 \times 3.5 \times 0.150 = 2.048 \text{ m}^3$.

Recommended baseline (heavy-duty, good ground)

- **Sub-base: 100 mm & 150 mm** MOT Type 1, compacted.
- **Slab: 125 mm C25/30** with **A193 mesh**, DPM below

Anticipated costs

Quantities used

- **Area:** 36.27 m²
- **Concrete volume (125 mm):** 4.534 m³ (+10% over-order → 4.99 m³)
- **Type 1 sub-base (100 mm):** 2.262 m³
- **Type 1 sub-base (150mm):** 2.048 m³
- **Mesh reinforcement:** A193, one layer over full area
- **DPM:** 1200 gauge over full area

Cost table (incl. VAT)

Item	Basis	Unit rate	Quantity	Subtotal
Excavation & formation	Light dig to formation, trim, dispose modest spoil	£12/m ²	36.27 m ²	£435
Type 1 sub-base supply	MOT Type 1 delivered	£45/m ³	4.31 m ³	£193
Sub-base placement & compaction	Labour + plate compactor	£10/m ²	36.27 m ²	£363
Shuttering/formwork	Timber, pins, set-out	£6/m ²	36.27 m ²	£217
DPM supply & install	1200 gauge, lapped/taped	£3/m ²	36.27 m ²	£109
Mesh reinforcement A193	Steel + chairs + laps	£9/m ²	36.27 m ²	£327
Concrete supply C25/30	Ready-mix incl. over-order	£140/m ³	4.99 m ³	£699
Concrete placement & finish	Labour, tamp/float	£18/m ²	36.27 m ²	£653
Saw-cut control joints	Cut/clean at ~3 m grids	£4/m ²	36.27 m ²	£145
Curing & protection	Sheeting/compound, barriers	£2/m ²	36.27 m ²	£73
Plant & small tools	Wacker, saw, mixer standby	Lump sum	—	£220
Prelims/overheads	Supervision, fuel, delivery	8% of works	—	£291

Item	Basis	Unit rate	Quantity	Subtotal
Contingency	Minor variations	3% of works	—	£109
Estimated total				£3,734