

The external dimensions of this oven are 2 x 1.6m while the internal cooking area is about 1200 x 900mm. The extra space is taken up in fire bricks and insulation required to keep the oven hot – the walls are around 245mm thick!

Wood-fired pizza ovens do their cooking by heat radiating from the thermal mass of the bricks. Before you start cooking, you have to set a fire to heat up the bricks in the oven. Once the bricks reach the required temperature, the inside surface of the bricks turns white. You then push the coals to the sides so that heat is maintained, shut the door and you're ready to cook. When you're cooking limit the air flow so the inside stays hot.

Gather your supplies

The base

- 100 x 50mm timber for formwork
- 1 piece of 1900 x 1500 F82 steel mesh
- 0.35 cubic meters of 20Mpa concrete
- 325 of dry pressed (solid) bricks
- 3 bags mortar
- 25 wire ties
- 1 of 75 x 10mm (or 85 x 8mm ribbed) x 1080mm galvanised steel lintel
- 2 or 3 of 75 x 10 x 1370mm galvanised steel lintels
- 2 sheets of 1780mm long corrugated iron
- 1 piece of 1290 x 1680mm F82 steel mesh
- 6 of 1680mm lengths of Y12 steel bars
- 0.3 cubic m of concrete (ready-mixed or mix your own)

Oven formwork

	Ends	Slats	Centre support
Material	19mm plywood	70x19mm pine	19mm plywood
Main chamber	900 x 630mm (2)	1162mm (19)	862 x 611mm
Door arch	480 x 400mm (2)	192mm (12)	nil
Flue arch	605 x 470mm (2)	192mm (14)	nil

The oven

Note: the quantities given are for this oven. Ask your supplier to calculate exact quantities needed for your sized oven. The curved arches are formed using straight and two different sizes of wedge shaped arch bricks. When ordering your materials, let the supplier know the arch sizes or better still have the templates with you, as you can then work out which combination of arch bricks will suit best.

Refractory materials

- 98 of 230 x 115 x 75mm straight (s/s) refractory bricks
- 110 of 230 x 115 x 75/63mm (or 2 1/2 inch) side arch bricks
- 60 of 230 x 115 x 75/51mm (or 2 inch) side arch bricks
- 5 of 20kg drums of Tufset Super refractory mortar (for thin joints)
- 5 of 25kg bags of Fireplas refractory mortar (for thicker joints)
- 3 of 1000 x 500 x 50mm Calsil (calcium silicate) boards
- 16 of 300 x 300 x 50mm refractory tiles
- 1 of 900 x 200mm diameter stainless steel flue plus cap
- 8 of 50mm Duraback batts
- 10 of 10kg bags of Insulite 1000L vermiculite render

You will also need

1 roll of 20mm chicken wire; steel door (made to suit); sharp washed sand; cement; oxide; Boncrete; Silasec. For cooking you will also need an ash rake and wooden or metal peel.

Here's how The base

STEP 1 As the pizza oven will weigh several tonnes when complete, it needs a solid base. This oven has a 1600 x 2000mm concrete base, 100mm thick, reinforced with F82 steel mesh. It is simply formed using 100 x 50mm timbers well staked to the ground and levelled. It is easiest with this quantity of concrete (allow 0.35 cubic metres) to have a mini load delivered. Pour in half the concrete, rake level and put in the steel mesh. Add the remainder of the concrete, screed level, float, let set and wet cure for a few days.

STEP 2 Mix a standard brickie's mortar of 1 part cement with 5 parts sand and Bycol added (or use bags of mortar mix), and lay 2 courses of bricks around the perimeter of the slab leaving a 900mm opening at the front (one of the 1600mm slab edges). Add corner bricks to form internal piers and an engaged pier half way along each long side.



STEP 3 Start building up the corners the equivalent of 1 1/2 bricks in each direction and offset the internal engaged piers about 15mm from the outer bricks, holding them in place with wire ties. Keep building up the corners and piers until they are 6 courses high. While a standard mortar joint is 10mm thick, in this case it's a good idea to make a 5mm thick joint for the internal piers, so the top of the piers will be lower than outside brickwork, and give the top suspended slab greater depth.



STEP 4 Infill between the corners with brick panels set 15mm back from the front edge of the bottom two courses. This gives the brickwork an attractive recess which can be rendered or bagged later to match the upper structure.



STEP 5 Complete the brickwork of all the recessed areas to the top of the corners, then

place a 75 x 10mm plain or 85 x 8mm ribbed lintel across the opening so it has 90mm bearing on both sides. Add a temporary timber prop under the centre of the lintel, then lay two more courses of brickwork in line with the brick corners at the base, and stopping the internal corner bricks and engaged piers one brick from the top. Clean up the brickwork with a stiff brush, and let set for a day or two.



STEP 6 Place another lintel across the front opening on the corner bricks and a third across the back corner bricks. Build a temporary loosely stacked pier of bricks in the centre to the same height as the piers and add another optional lintel across the centre. Place corrugated steel across the lintels to fill the space and act as bottom formwork. Cut F82 steel reinforcing mesh so it will be about 40-50mm short at each side. Also cut 6 Y12 bars to further reinforce the suspended slab.

STEP 7 Make a mix of standard concrete (1 part cement, 2 parts sand and 4 parts aggregate) or order more ready-mixed concrete. Pour in half the concrete, lay in the steel mesh and the 12mm steel bars as reinforcing across the piers and centre.

STEP 8 Fill the slab to just over the top surface of the bricks, and with a helper, screed the concrete with a chopping action to eliminated air bubbles and smooth the top surface to the level of the brickwork. Finish with a wooden trowel for a smooth finish. Let set and cure wet for a few days.

Oven formwork



STEP 9 Construct formwork for the main chamber using the diagram to form the shape of one end. The numbers around the perimeter indicate the wedge brick sizes to be used to form the arch in metric (on outside) and Imperial (on inside) units. Cut out the end with a jigsaw, trace and cut out a second end, then screw the slats between the ends so there are only a few narrow gaps between the slats. Only screw on from the outside as the screws need to be removed to collapse the formwork later. Cut a centre support to loosely sit under the slats in the middle. Lift on the platform so it is centred between the sides and 260mm from the back. Scratch the position on the concrete, lift the formwork, then loosely locate the centre support under the slats and lower the formwork. Make the door and flue arch forms the same way, but without the centre support, ready for use later on. Scratch their position on the concrete as well.

The oven

STEP 10 Check that main chamber formwork is correctly located. Using a pre-mixed refractory mortar designed to take high temperatures, butter each brick as you are about to lay it with a thin bed and lay two courses of straight refractory bricks, marked s/s on the templates, along each side of the formwork. The mortar goes off fairly quickly (2-3 hours) so needs to be used quickly before it skins. Limit the thickness of mortar joints to a maximum of 3mm, ideally 1-3 mm, as the mortar will shrink and you will end up with a tighter oven with less cracking.



STEP 11 Form the curve of the chamber using refractory side arch bricks, which are wedge shaped on their ends. Use two sizes which reduce from 75 to 63mm (2 1/2 inch) and from 75 to 51mm (2 inch) in combination to form the radius of the arch. The wedge-shaped bricks are laid exactly the same as straight bricks, and are supported by the form. Check for level as you build up the courses.

STEP 12 The mortar will set over about 48 hours, and even longer during wet weather, so don't remove the formwork until mortar has set. Cover the arch with a tarp if rain threatens, as the mortar will soften again if it gets wet.



STEP 13 Strip the formwork by unscrewing the plywood ends, then knock out the centre support. Remove the slats and check for gaps in the mortar joints. Using more of the mortar, fill in any gaps, but do not render or bag the inside surface.



STEP 14 Build the back wall as a separate wall, cutting the ends of the bricks to follow the curve as you build up the courses. Make sure there is a good vertical bed of mortar between the arch and the end wall, and as this may be thicker than mortar beds, use the Fireplas mortar which can be used in wider joints. Slightly rough brick ends do not really matter as all this brickwork will be covered in insulation and rendered.



STEP 15 Cut and install sheets of calcium silicate board to fit inside the base of the oven. This board is easily cut with a handsaw and sits on the concrete loosely. Follow with the 300 x 300mm refractory tiles to form the cooking surface of the oven. Also cut and install the sheets and tiles to fit out the door and flue arches, using the scratched outline as a guide.



STEP 16 Using the small door arch formwork, build the arch of single stacked bricks on top of the refractory tiles with only straight and 75 to 51mm (2 inch) side arch bricks. Before laying the bricks make sure the arch is completely vertical on its face, otherwise the geometry of the arch will not work. Use small timber wedges under the ends to make any adjustments.

STEP 17 Fill in the gap between the door arch and the main chamber with straight **Continued**

This project involves quite a deal of bricklaying, so if you are not experienced, the base structure will give you plenty of opportunity to hone your skills. And if it's too messy, you can always bag it to match the oven.



How much a pizza?

The simplest way to build a pizza oven is with a precast kit for about \$2300 (1100mm diameter internally) which consists of precast concrete dome sections that simply slot together, or make a similar sized dome for about \$1500 using plain fire bricks over a sand form. Both need to be heavily insulated, a flue and an oven door.

To build a large tunnel oven (1200 x 900mm internally) such as this with door and flue arches, will cost about \$2600 in refractory materials. On top of the oven you will need to add the cost of the base structure and the outside render (about \$750), and the peel (for handling the pizzas) and the ash rake (about \$200 for the two).

It's important to insulate the oven well, as temperatures can peak well above 450°C inside and you need to sustain high temperatures inside as you cook, at the same time keeping the outside cool enough to avoid accidental burning.

Make your own pizza oven & outdoor setting

Create a pizza piazza with this brick pizza oven and super-easy-to-build outdoor setting.



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bricks, cutting and shaping them to suit different curves on the two arches. As the gaps will be larger, use Fireplas refractory mortar to fill in irregular gaps. Again, this brickwork does not have to be highly accurate as the whole lot will be covered with insulation and render.



STEP 18 Before building the flue arch, make sure the door arch has set, then carefully remove any wedges and pull the form straight back. The arch should support itself. If you have trouble pulling out the form, drill some finger holes in the end to help.



STEP 19 Bring in the flue arch formwork, again checking that it is truly vertical, then start laying the arch with two courses of straight, then 63mm bricks followed by 51mm bricks. This brickwork must be neat with neat joints, as the bricks will remain exposed as a feature. Lay all the fire bricks up to the last four at the top. Cut 50mm pieces off the ends of the four top bricks, and bed them in place to allow room for fitting the flue in the centre of the arch.



STEP 20 Let the mortar set for an hour or two to gain a little strength. Squeeze the chimney slightly front to back, so that will fit between the part bricks and door arch. Cut a few more small brick wedges to fill in the gaps, then set the flue and wedges in a thick bed of mortar.

STEP 21 Use more mortar to smooth and render the flue in place. Let set, propping the flue upright if necessary. Remove the flue arch formwork so the joints can be cleaned up with a scourer and fill any empty joints. Let stand and cover with tarp for a few days to gain strength.



STEP 22 Cover the main oven and door arch with mineral wool insulation blanket, cutting it to shape with a utility knife where necessary. Wear a dust mask and gloves as some fine fibres can be released. Shape chicken wire to cover all the areas to be rendered, working the mesh up to the back of the flue arch.



STEP 23 Wearing a respirator because of the dust, mix complete bags of Insulite vermiculite render with water. Only mix full bags as the contents tend to settle and you may not get a proper mix if only a half bag is mixed. Try to achieve a mix the consistency of wet beach sand. You can try to trowel it on, although as the surface is soft and pliable, it's easiest to pack it onto the surface by hand using gloves. Work from the bottom up. Persevere, as this material does not stick well and needs to be patted into place. When set apply a second coat to achieve a total vermiculite render thickness of around 50mm.

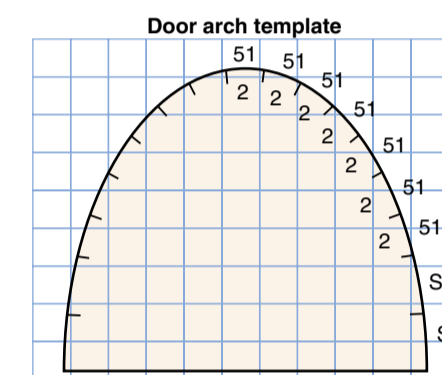


STEP 24 Make a mix of 4 parts sharp sand, 1 part cement and oxide colouring (we used yellow) to make a render mix. Add a bonding agent (such as Bycol) and waterproofing liquid (such as Silasec) to the mixing water to aid in adhesion and to waterproof the render. Apply in two or three coats using a timber float to build a total thickness

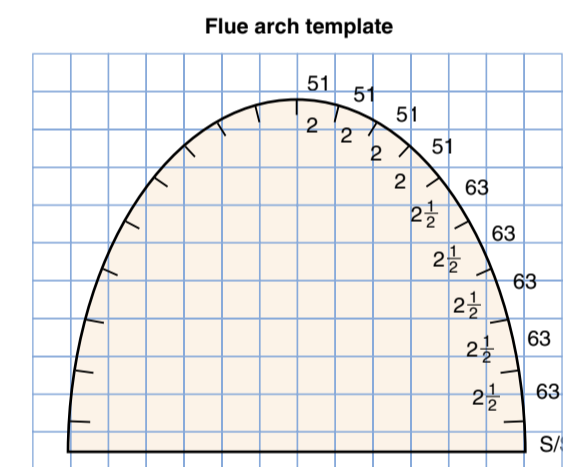
of 30mm, giving the oven an adobe look. Let set and cure for at least a week. We also bagged the recessed panels in the brickwork base.

STEP 25 Give the oven a final clean up, and if necessary remove mortar smears with a little diluted hydrochloric acid after thoroughly dampening down the brickwork. When first using the oven, start with a small fire to gradually dry out the building materials. Do this a couple of times as it takes a while to dry out the bricks. Only when the bricks are thoroughly dry can you build a fire to bring the oven up to operating temperature. When the internal bricks go white, you know the temperature for cooking has been reached.

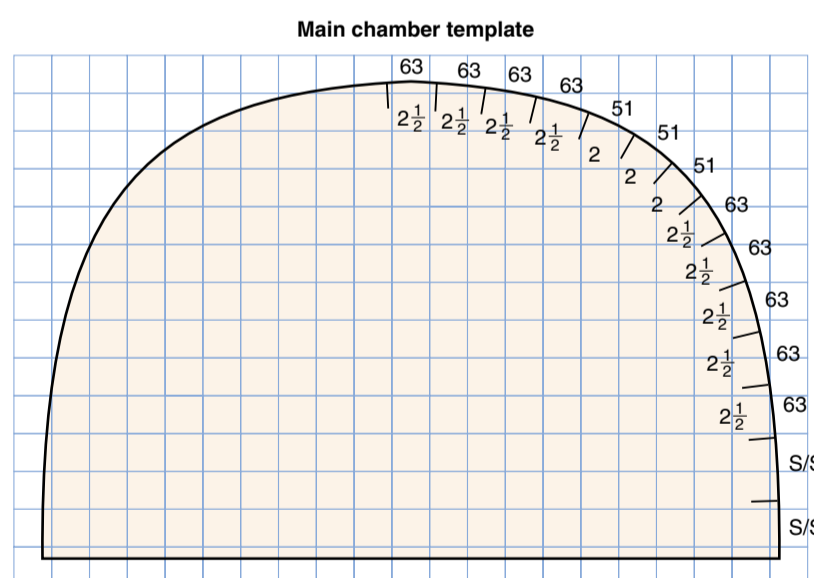
Stockists:
Pizza oven built by **Dean Tolomeo, 0407 432 754**.
All refractory bricks, mortars, insulation, flue and steel door, **Field Furnace Refractories, (02) 9729 1799** or check under Refractories in the Yellow Pages.
Table and bench developed and built by **Nikos Grammenos, (02) 4751 6190**.
All outdoor setting materials, **Warringah Timbers, (02) 9981 3733** or warringahtimbers.com.au



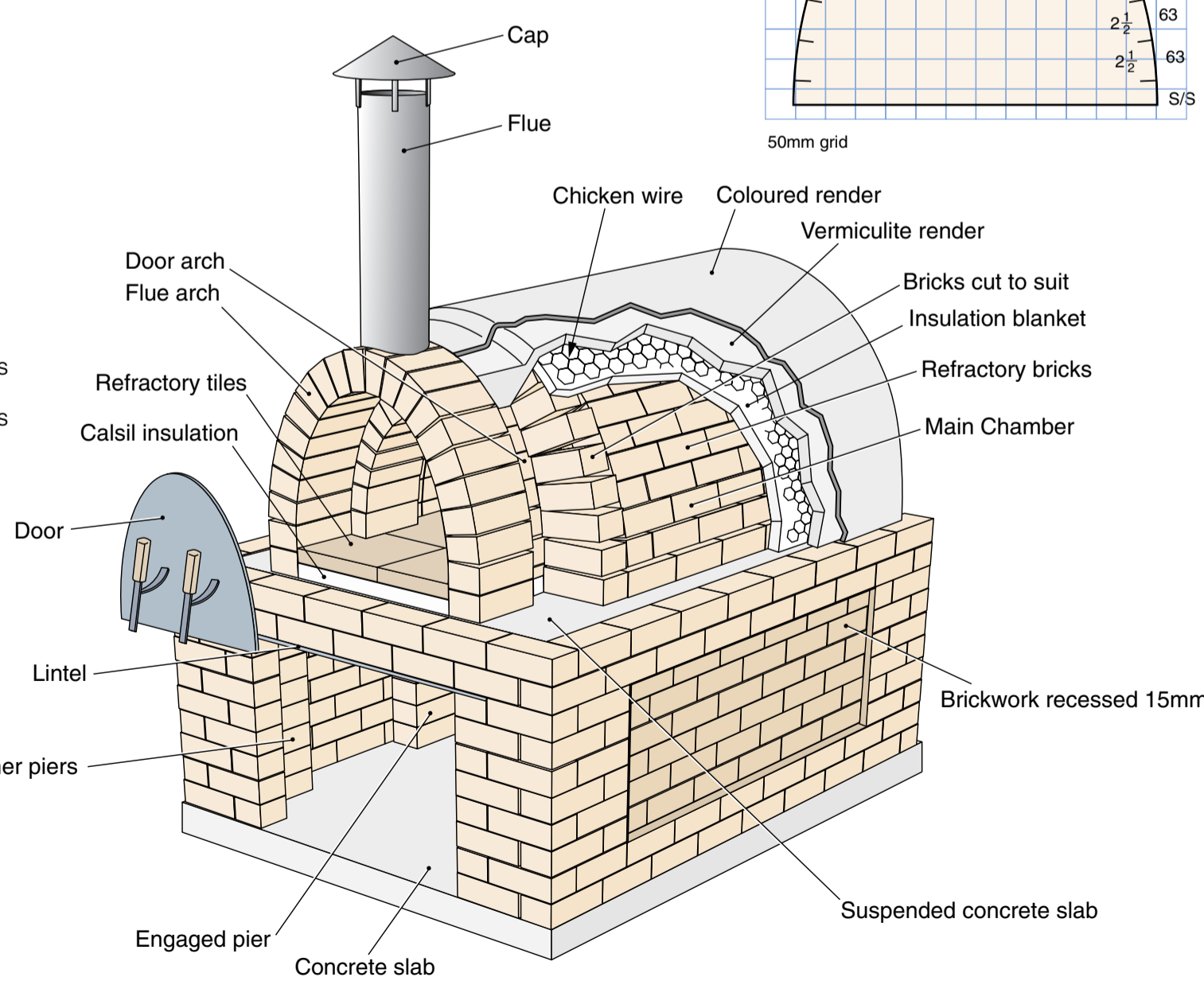
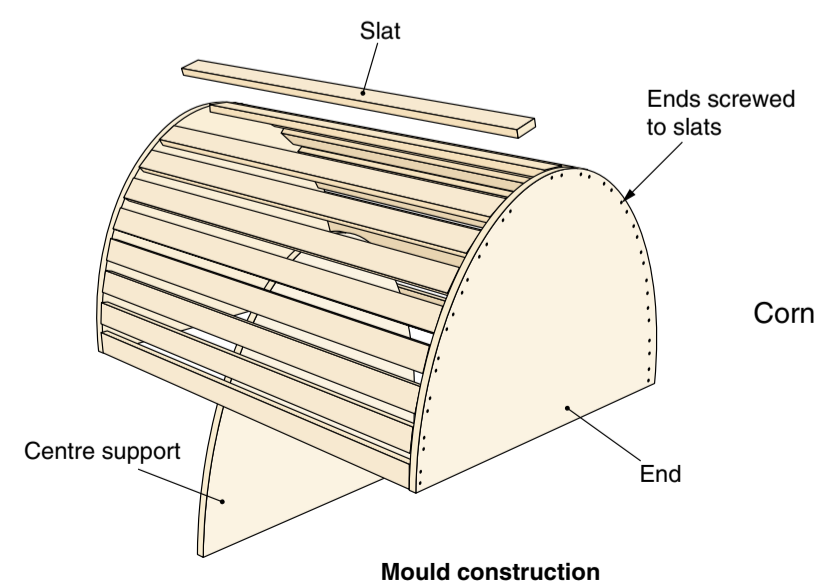
50mm grid



50mm grid



50mm grid



Make your own outdoor setting

To sit everybody down, while they gaze in awe at your traditional pizza-making skills, you'll need an outdoor setting large enough for eight with handy side tables to take care of the overflow.



Here's how



STEP 1 As many of the components of the table and benches are the same, it's worth setting up a block jig so you can cut multiple lengths of timber at once. Simply screw two 90 x 45mm blocks to a flat surface making sure the angle between them is exactly 90 degrees. To cut say 10 boards at once, stack them 2 deep and clamp to the blocks, using a further block as the clamp. Mark the required length, square across then use a power saw to make the cut.

STEP 3 Glue and screw the end support to the rail, then screw through the legs into the supports with 75mm bugle head screws. Repeat for the other leg assembly. Join the 2 leg assemblies with the long rail (D), then add the centre support (E) between the long rails.



STEP 2 Place 2 of the legs (A) on a flat surface and place an end support (B) between them to get the spacing. Check that they are parallel, then lay a short rail (C) across the legs, making sure they are flush at the top and ends, then glue and screw in place checking that the joints are square.

STEP 4 Find the centre along the end supports and mark 45mm to one side. Nail in place the centre table top board (F) so it has a 20mm overhang at each end. Add the 2 edge boards so they will have an even 20mm overhang to the sides. Then infill the remaining boards and nail down keeping gaps and overhangs even.

STEP 5 Building the benches and stools is essentially the same, just with different sizes. To space the 4 boards evenly, fix the two outer boards with the 20mm overhang, then space the other 2 by eye before nailing down.

Gather your supplies

Table

Item	Part	Size	Material
A	Legs (4)	66 x 42 x 730mm	Pre-primed LOSP pine
B	End supports (2)	66 x 42 x 1040mm	Pre-primed LOSP pine
C	Short rail (2)	90 x 18 x 1124mm	Pre-primed LOSP pine
D	Long rail (2)	90 x 18 x 1160mm	Pre-primed LOSP pine
E	Centre support	66 x 42 x 1124mm	Pre-primed LOSP pine
F	Top (13)	90 x 22 x 1200mm	Treated decking pine

Bench

Item	Part	Size	Material
A	Legs (4)	66 x 42 x 430mm	Pre-primed LOSP pine
B	End supports (2)	66 x 42 x 240mm	Pre-primed LOSP pine
C	Short rail (2)	90 x 18 x 324mm	Pre-primed LOSP pine
D	Long rail (2)	90 x 18 x 1160mm	Pre-primed LOSP pine
E	Centre support	66 x 42 x 324mm	Pre-primed LOSP pine
F	Seat (4)	90 x 22 x 1200mm	Treated pine decking

Stools

Item	Part	Size	Material
A	Legs (4)	66 x 42 x 430mm	Pre-primed LOSP pine
B	Supports (2)	66 x 42 x 240mm	Pre-primed LOSP pine
C	Short rail (2)	90 x 18 x 324mm	Pre-primed LOSP pine
D	Long rail (2)	90 x 18 x 360mm	Pre-primed LOSP pine
F	Top (13)	90 x 22 x 400mm	Treated pine decking

Note: LOSP pine is light organic solvent preservative treated.

You will also need

Spare 90 x 45mm timber, old sheet of ply, 75mm bugle head screws

