Bench parts list

Bench replacing a fence section. All sizes in mm. The images and numbers come from `bench.scad`; regenerate them after changing a parameter (commands at the end).

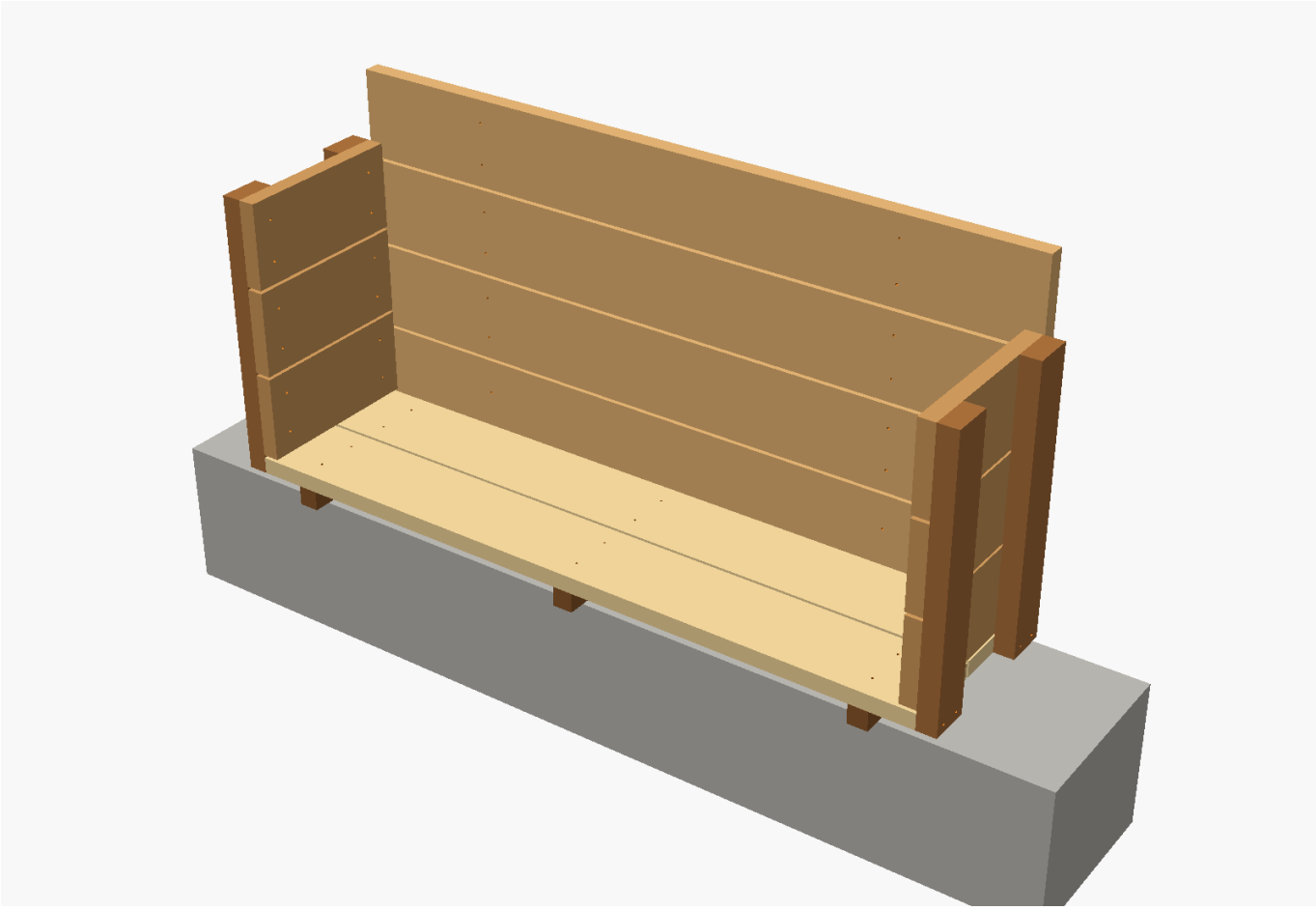

Figure 1: assembled

Wooden parts

Decking boards 28 x 145, post 70 x 70. A cut with a 3 mm kerf turns the post into halves of 33.5 x 70 and quarters of 33.5 x 33.5.

Part	Qty	Description	Size
A	2	seat board	28 x 145 x 1200
B	4	back board	28 x 145 x 1200
C	6	side board	28 x 145 x 295
D	4	side upright, half post	33.5 x 70 x 478
E	3	batten under seat and back, quarter post	33.5 x 33.5 x 328
F	2	back post, uncut	70 x 70 x 750

Post stock:

- 959 for the uprights: cut to length, then halved lengthwise. One half gives two uprights.
- 328 for the battens: quartered lengthwise, one quarter spare.
- 2 x 750 for the back posts.

Upright, batten and back post lengths are estimated from photos. On the built bench these parts were cut to fit, and everything was sanded flush, so the plan and the bench differ by a few mm in places.

Hardware

No.	Qty	Description	Use
1	56	wood screw 5 x 50	12 seat to battens, 24 side boards to uprights (from inside), 8 uprights to seat end grain, 12 back to side board ends
2	14	wood screw 5 x 70	back to back posts, 7 per post, from the front
3	2	concrete screw 10 x 150 with washer	back posts to the fence foundation
4	12	PP washer, 5 thick	spacers between side board ends and back, one on each screw through the back

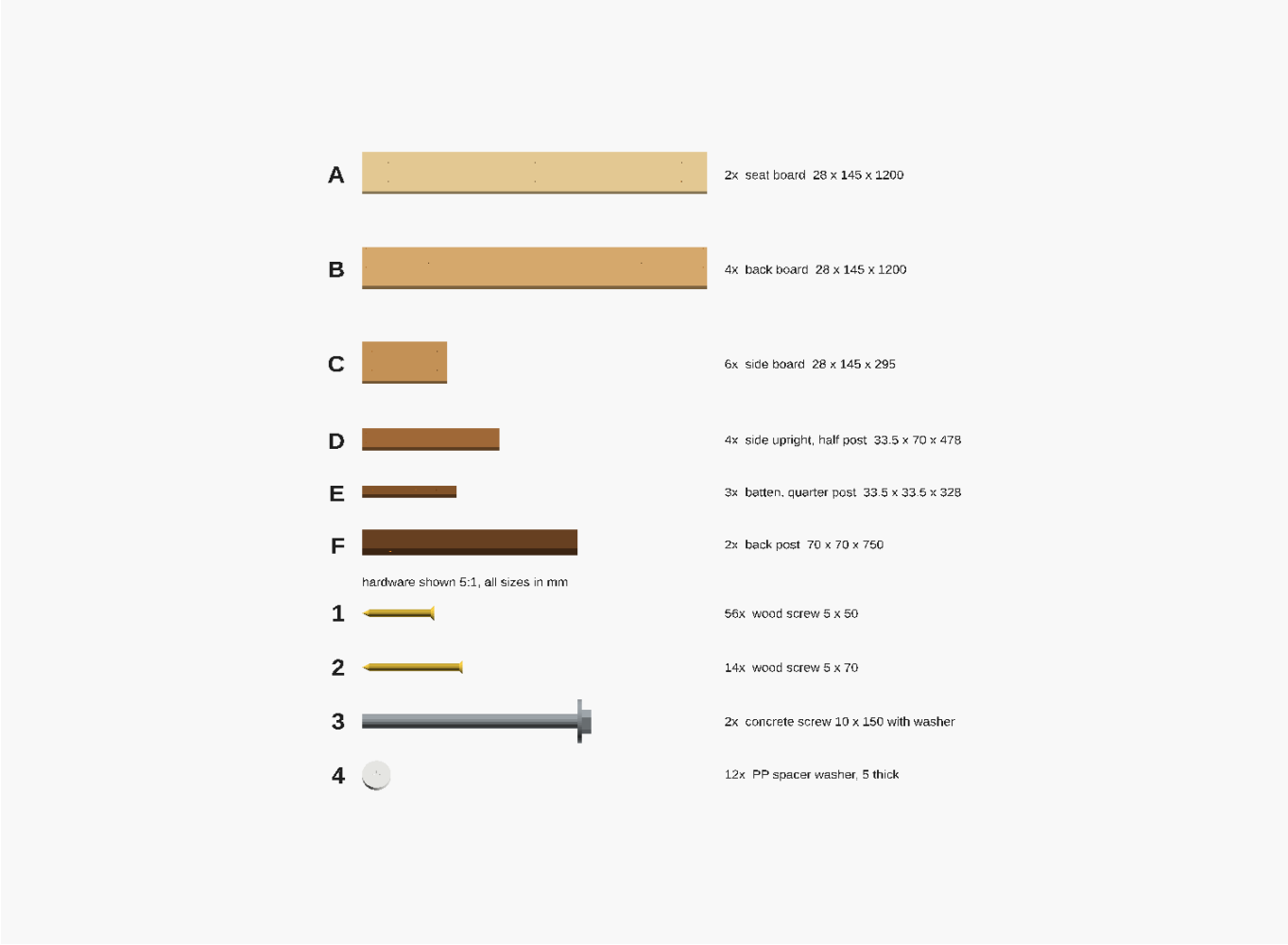

Figure 2: parts

Assembly

- The seat boards (A) lie on the three battens (E), one 90 from each end and one in the middle.
- The side boards (C) sit 5 above the ends of the seat. Their outer faces are flush with the seat ends.
- The uprights (D) are screwed to the outside of the side boards, flush with their front and rear ends. They reach down to the bottom of the seat and are screwed into the end grain of the seat.
- The back (B) stands on the rear ends of the battens. It is screwed through into the rear ends of the side boards, with a washer (4) on each screw.
- The back posts (F) stand behind the back, 230 in from each end, and reach 161.5 below the foundation top. Each is fixed with one concrete screw (3) into the side of the foundation.

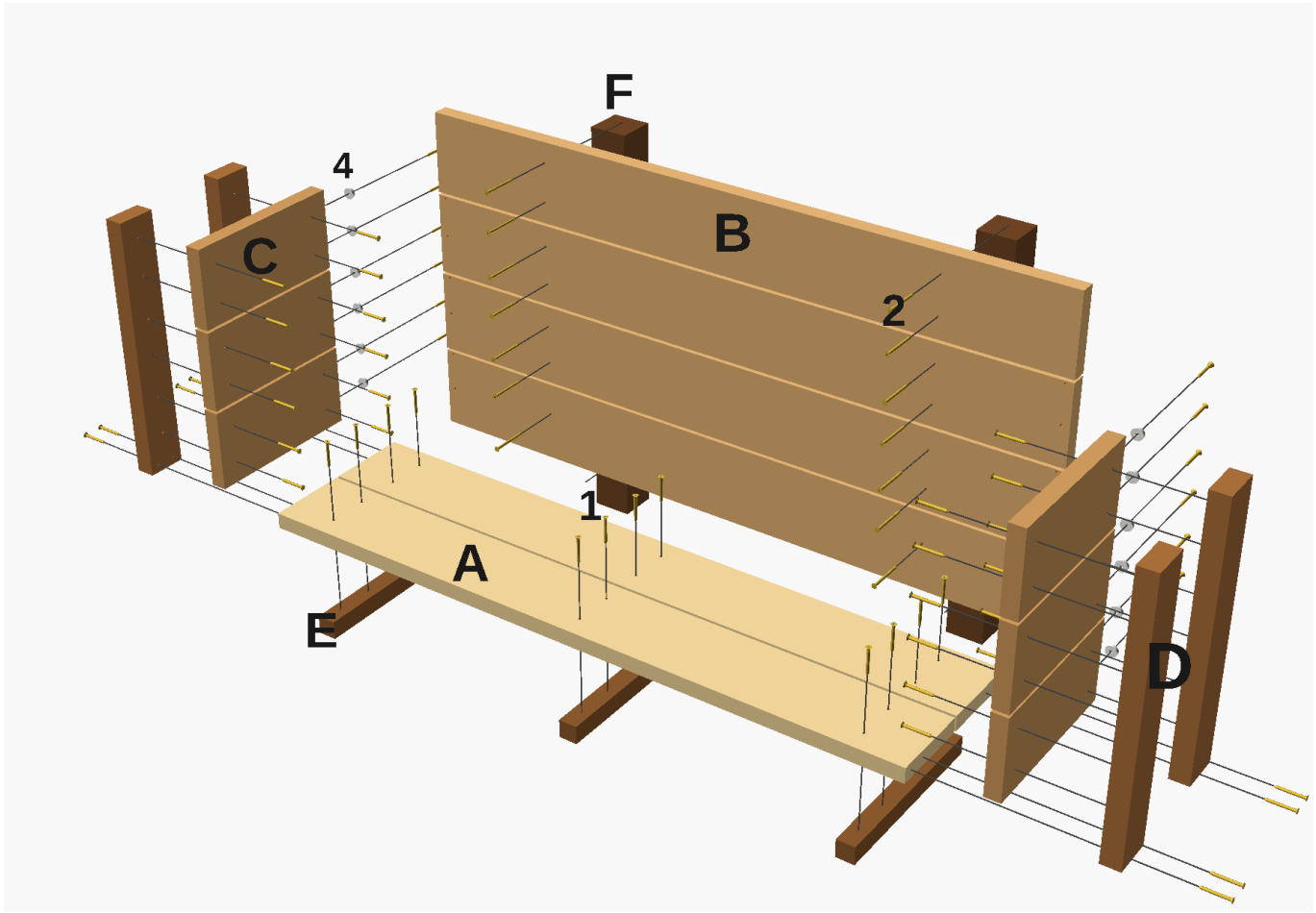

Figure 3: exploded, front

All gaps are 5: between boards, between the seat and the back, between the seat and the sides, and the washers between sides and back. They let water and debris drain and leave room for the wood to swell. The seat top is 61.5 above the foundation, the top of the back 628.5. Overall width 1267, depth 328 without the back posts.

All screw holes are drilled 4 for the wood screws and 10 through the back posts for the concrete screws (parameters `scr_hole_d` and `anchor_hole_d`).

The washer diameter (20) and the foundation size in the model are not measured; they only affect the images.

Regenerating the images

The customizer in OpenSCAD has `preview_explode`, `preview_hardware`, `preview_labels` and `preview_foundation`. The labels turn to face the camera. With hardware shown and the parts exploded, thin lines run from each screw along its axis to where it ends. Images from the command line, with `O` set to the OpenSCAD binary:

```
O=/Applications/OpenSCAD.app/Contents/MacOS/OpenSCAD
A=--colorscheme=Tomorrow
L="-D preview_hardware=true -D preview_labels=true"
$O -o bench_assembled.png --imgsize=1600,1100 --camera=600,250,150,60,0,35,3500 $A -D preview_foundation=true be
$O -o bench_exploded_front.png --imgsize=1800,1250 --camera=600,250,250,60,0,35,3600 $A $L -D preview_explode=15
$O -o bench_exploded_rear.png --imgsize=1800,1250 --camera=600,250,150,60,0,215,4300 $A $L -D preview_explode=15
$O -o bench_parts.png --imgsize=1500,1100 --camera=0,0,0,20,0,0,0 --viewall --autocenter --projection=ortho $A -
```

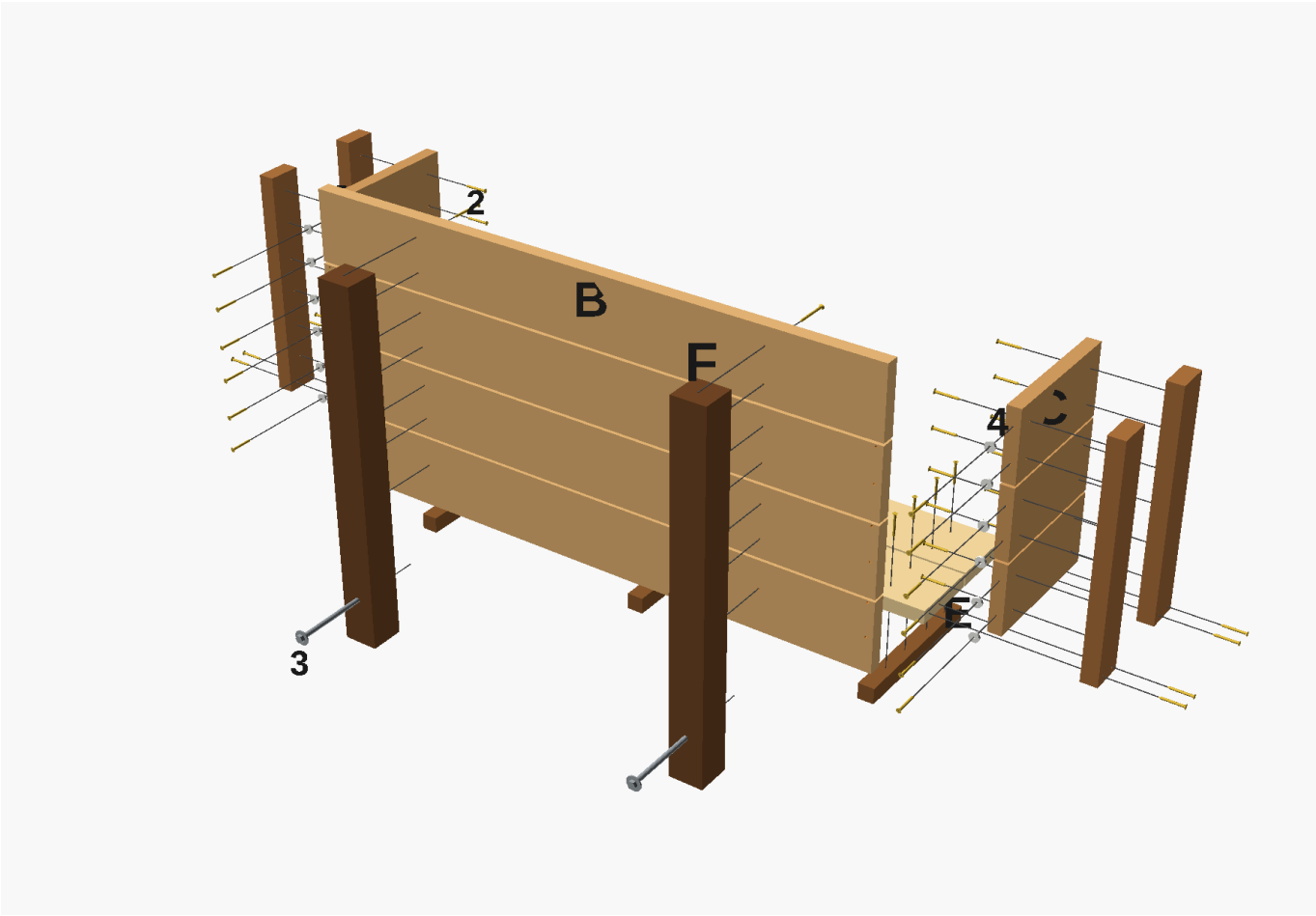

Figure 4: exploded, rear