

Be sure your soil is strong enough before building.

March 2021

Remove any gravel that is 2 mm or larger from the fill. Dampen the soil a little, just enough to make small balls hold together. Shape 12- 15 balls carefully to the right size.

Dry samples in the shade for a few hours, then place in an oven at 93° C (200° F) until the whole batch doesn't get any lighter (check the batch with a kitchen scale every half hour).

### **BALL CRUSH METHOD**

Balls can be slightly flatter than perfectly round. When dried, compare the balls to circles or bottle caps the right size (Figure 9a). Don't use samples that are too small or too big.

Crush at least ten balls underfoot. Write for each one when they crush into pieces.

Find someone light. Add weight to their pockets until they weigh 60 kg (132 lb). Wear a rubber-soled shoe and put a heel on one ball. Don't twist! Slowly lift the toe to shift weight onto the ball. Then lift the other foot off of the ground (Figure 9b). Hold lightly on a wall or person until steady but then let go to put the whole weight on the ball.

If a ball holds the whole weight without cracking or crushing, it is at least a minimum strength for earthbag 1,3 Mpa (190 psi).

If the ball doesn't crush, put a piece of wood on top and try again (Figure 9c).



*Figure 9 Crush balls underfoot (left to right): a- Use 30 mm balls only; b- balance on a ball; c- Put a piece of wood on a strong ball to retest.*

If a ball under wood supports one foot with toe up but crushes when the tester starts to lift up the other foot, that is about half the tester's weight. This means the ball is a medium strength for resilient CE earthbag, at least 1,8 Mpa (260 psi).

If the ball doesn't crush until the tester is standing on one foot with the other completely off the ground, then the soil is strong, at least 2,1 Mpa (300 psi).

Soil strength is the average of all the 30 mm balls. If only one ball is weaker, don't count it.