

7.4 SITE MANUFACTURE OF BST CONCRETE

This information sheet describes the method for mixing BST Concrete on site in a small concrete mixer. Mixers are generally 3 cu ft or 0.1 cu metres capacity, which is about one wheelbarrow full of concrete.

1 MATERIALS

Cements

BST Concrete Sample Mix Designs have been based on Type GP cement. Other types of cement are suitable, but their effect on yield and performance should be determined before using them in production.

Note that the BST coating generates some 12% entrained air in the concrete. Consequently, it has been found that the use of fly ash blended cements can suppress some of the entrained air (as will occur in standard concrete). Yield losses of up to 6% have been measured in trials with fly-ash blended cements. Trials of such cements are strongly recommended before using them in production.

Aggregates

In BST Lightweight Concrete, aggregates consist of the following –

Sand which should be fine to medium grade. 50% coarse sand and 50% fine sand is recommended for optimum mix consistency

10 mm aggregate
used in densities over 1,400 kg/m³

BST Lightweight Concrete Aggregate
supplied in 200 litre bags or 1,000 litre and 1,500 litre bulk bags

Water

Mixing water is to be clean and suitable for the manufacture of standard concrete.

Admixtures

Use admixtures which comply with AS1478 as for standard concrete. Generally, water reducing admixtures are used with BST Lightweight Concrete. Water reducers of the lignin or lignin polymer base are preferred. Melamine based products do not perform as well with BST Lightweight Concrete.

Set retarders are commonly used in hot, dry weather conditions. BST Concrete mixes have high cement contents and low water/cement ratios. Therefore, they will set faster in hot weather. BST Concretes do not bleed, so the surface will dry faster in hot, dry and windy conditions.

2 MEASURING PROPORTIONS

The Sample Mix Designs show quantities for one cubic metre of BST Concrete. For small, site mixers of 0.1 cu metre capacity, use one tenth (or less) of the proportions shown.

Cement and sand are shown in kilograms. BST aggregate and water are shown in litres. It is often convenient to measure quantities in 10 - 20 litre plastic containers.

For cement and sand, weigh out the correct quantities into a container and mark where the material comes to in the container. Thereafter, fill the container to the appropriate mark for each batch.

Similarly, mark on another container where the correct quantity of water comes. After the first batch, endeavour to use exactly the same quantity of water each time to ensure consistency from one batch to the next.

The BST aggregate quantity will usually be between 45 and 100 litres per batch. Consequently, two to five 20 litre container loads of BST will be required. Alternatively, it may be possible to estimate the quantity from the bag, which contains 200 litres.

When measuring BST aggregate into containers, shake down the contents to achieve the correct volume.

Use a separate container for each different material - ie for each of the cement, sand, water and BST aggregate.

3 MIXING

For the first load, when starting with a clean, dry mixer it is recommended that the mixer be “buttered”. This consists of mixing a small quantity of cement and sand, with sufficient water to make a wet slurry. Run the mixer until the inside surfaces are completely coated with the slurry, then discard the slurry. This procedure will ensure that the first load of concrete mixed will not leave some of its slurry (cement, sand and water content) adhering to the mixer after discharge.

The following mixing procedure is recommended.

- 1 Place the full quantity of sand and cement into the mixer.
- 2 With the mixer running, add about two thirds of the mixing water and mix thoroughly to produce a well mixed slurry.
- 3 Add the full quantity of BST aggregate gradually and continue mixing.
- 4 Continue mixing while adding sufficient of the remaining mixing water to achieve the desired workability of the mix. Note the total quantity of water added, and add this at point 2 above for subsequent loads.

More information

For further information on BST Lightweight Concrete and its applications contact –

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Notes

- 1 Do not put hands into the mixer while it is turning.
- 2 Take care in loading BST aggregate in windy conditions. It is very light and will easily blow away.
- 3 Dispose of surplus material or washout water thoughtfully to prevent BST aggregate and cement from entering stormwater drains.

4 RELATED INFORMATION SHEETS

Other BST Concrete Information Sheets related to the above include -

- 1.4 Health and Safety Information (Material Safety Data Sheets)
- 7.3 Sample Mix Designs

