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SAND SELECTION

Selecting a Sand

Sand and larger sized aggregates make up the larger proportion of most mortars. Colour, texture and overall strength are all strongly affected by the choice of aggregate.

The aggregates most commonly used with hydraulic lime are sand and grit, although for the purpose of matching historic mortars various impurities may have to be added. A good sand should be a washed sharp sand with angular grains to ensure good bonding qualities. Soft building sands should be avoided as their rounded grain shape can result in excessive shrinkage.

Sands used should be well graded with a range of grain sizes, which for most plaster, render and mortar work will range from 5mm down to 75 micron. Larger sized aggregates may be used in some mortar or pointing work. As a rule of thumb for pointing, the maximum size of aggregate should be no bigger than one third of the joint width. Sands, which contain a clay or silt content of more than 4% should be avoided, as these will inhibit the contact between lime binder and aggregate.

Sands which have a high fines content also be avoided as the larger surface area of these will require more water to be used in the mixing. This higher water content will induce shrinkage and can affect flexural and compressive strengths. Monogranular sands should be avoided as they will possess poor workability qualities and will inhibit good vapour exchange i.e. the ability to breath.

Typical sand Grading Examples

General mortar work

% retained on sieve:

5.00mm 5%

2.36mm 8%

1.18mm 16%

600 micron 25%

300micron 31%

150micron 12%

150micron 3%

Sand Void Percentage

Once you have identified a good local sand, it is worthwhile to establish its void percentage. Knowing the voids in the sand tells how much binder is required in order to fill the voids.



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Insufficient binder to fill the voids will weaken the material and make it vulnerable to frost damage.

The procedure is simple:

1. Take a container of known volume (a two litre jug or jar is ideal) and fill it level to the top with the selected sand.
2. Remove the sand and dry it completely in an oven on a tray.
3. Replace it in the container to a level top.
4. Take a measured jug of water and gradually add the water until bubbles stop rising and the water has saturated the sand.
5. The void ratio can then be calculated from the amount of water used. If for example the amount of water used was approx 30% of the total volume then a mix ratio of 1 part lime to 3 parts sand (by volume) would fill the voids.