3 Porosity of pointing and bedding mortars

The porosity of a selection of mortars has been analysed. Figure 3.1 shows the results of analysis of a number of samples. Analysis was made by mercury porosimetry. The porosimeter used in these experiments was a Micromeritics PoreSizer 9320. This is capable of measuring pore diameters between about 0.006µm and 350µm (1µm = 1/1000thmm). Mercury porosimetry can be used to measure both the amount of void space in a sample (the effective pore volume) and the distribution of pore sizes. It works by intruding mercury into the sample under vacuum. The pressure required to force mercury into the pores is proportional to their diameter. Pore diameters are shown along the horizontal axis. The vertical axis shows the volume of mercury taken up by the sample at each measured pore diameter, so a peaks in the graph occurs at the dominant pore size (or sizes).

More porous, permeable mortars (e.g. lime mortars) generally have more abundant, larger pores. While mortars of this type take up moisture relatively easily, they also disperse and lose moisture relatively rapidly. The most porous mortars sampled were the pointing and bedding mortars from Victoria Road, Torry. The least porous was a pointing mortar (sample "Pointing A").

Table 3.1 Porosity data from mortar samples.

	Porosity (%)	Dominant pore size (um)
Lime mortar	30.1	2.86
1:3:12 mortar	30.6	0.95
1:1:6 mortar	28.2	0.51
Andy A	25.4	0.95
Pointing A	13.3	0.09
Pointing B	24.6	0.32
Pointing Victoria Rd	27.4	13.82
Bedding Victoria Rd	28.6	5.34 & 0.70

Figure 3.1 Pore size distribution of samples of test blocks of various mortars.

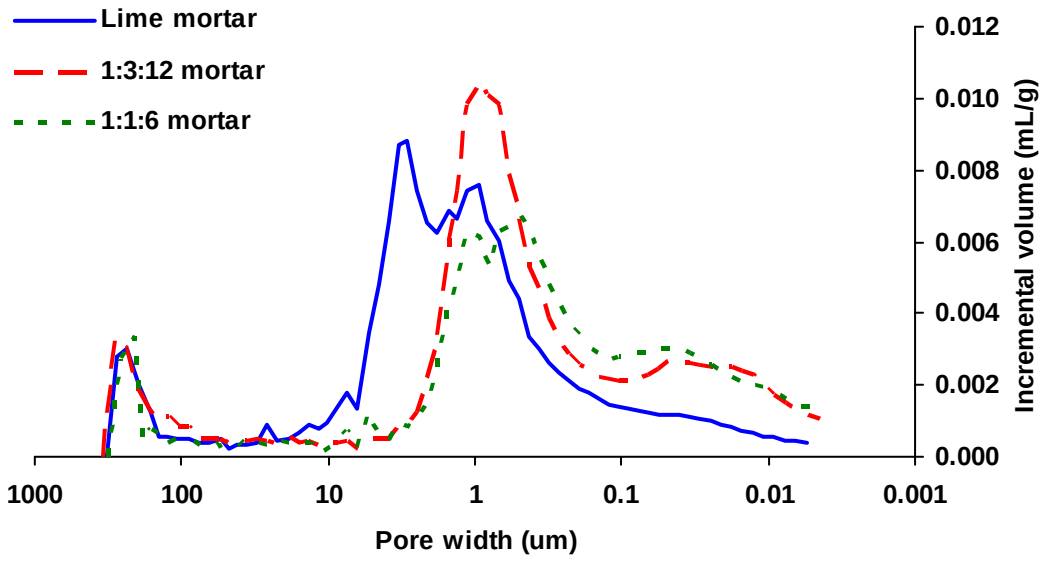

Figure 3.2 Pore size distribution of various mortar samples.