



# Carved Stones Adviser Project

## Field Guidance Notes: Stone Types Used For Memorials

The stone types most commonly used for memorials in Scotland - **sandstone**, **marble**, **granite** and **slate** - are likely to be already very familiar due to their widespread use as general building materials. These rock types may be more difficult to recognise, however, if they have become weathered or eroded. The following notes help to identify the rock types most frequently used for gravestones, as well as recognising more unusual materials such as **schist**, **gneiss**, **dolerite**, **gabbro**, **gritstone**, and **limestone**. Each stone is described in terms of their appearance by to the naked eye, under a magnifying glass or hand lens (10x magnification) and when worked.

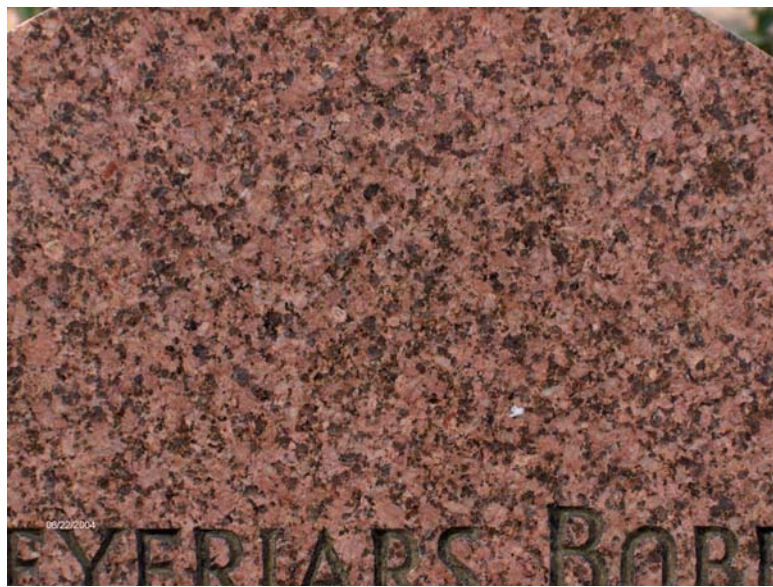
## Granite

is a hard-wearing **coarse grained** rock, which has a **mottled appearance** and is made up of several different types of minerals including:

- feldspar which gives the granite it's overall colour (often pink, can be white or grey, non-vitreous)
- quartz (usually clear, white or greyish glassy crystals)
- mica (silver or brown-black glistening flakes that readily catch the light).

<b>How granite looks under a hand lens</b>	Crystals are <b>large</b> enough be easily seen with the naked eye (although, a hand lens will reveal their appearance more clearly if the stone's surface has not been polished). The crystals are <b>closely packed</b> and fit together like a three-dimensional jigsaw. The particles interlock with their neighbouring crystals in a <b>random arrangement</b> . This distribution is important because if the crystals appear aligned into bands then the material in question is more likely to be gneiss.
<b>Colour</b>	Most common colours of granites are grey, pink or red. A "black" granite is more likely to be dolerite.
<b>Gravestone designs</b>	Granite <b>often has a polished surface</b> that emphasises the mottled crystalline structure of the stone, making it easy to recognise without a hand lens. Granite may also be worked so it has an <b>even unpolished surface</b> or may have a <b>'rustic' finish</b> (an uneven, craggy surface that looks quite roughly hewn) but in both cases the structure and size of granite crystals are more easily seen using a hand lens. It is quite common for more than one surface treatment to be used on a single granite memorial. Check the construction of the gravestone – if it looks like a polished panel has been attached or inserted into the surrounding stone then it is possible that you are looking at a gravestone made up of two different material types. If there is no evidence that the panel has been attached or inset then you are probably looking a memorial that is made entirely from granite, which has been selectively polished.
<b>Changes to granite in the graveyard</b>	Granite can be obscured by algae, lichen and pollution deposits but unlike other types of stone this does not usually result in a dense, total coverage of the stone's surface.

<p><b>Stone types that can be mistaken for granite</b></p>	<p>Marble is sometimes initially confused with granite but if you follow the identification steps above and in the marble table, in practice, the difference between these two stone types will become readily apparent. Other stones that share a similar appearance that could be mistaken for granite are:</p> <ul style="list-style-type: none"><li>• <b>Dolerite</b> is commonly known as '<b>black granite</b>'. Like granite it is an igneous rock with speckled crystals that can be seen without a hand lens. Dolerite is a black rock, which can be polished. It is made up of dark coloured crystals with grey or white feldspar. Some dolerites can also have small quantities of quartz.</li><li>• <b>Gabbro</b> is another unusual choice of stone. It is a dark very coarse-grained igneous rock, similar in appearance to granite. Gabbro's crystals can also be seen with the naked eye but differ from those found in granite because they are not quite so well formed. As a result gabbro has patchy, rather than speckled, areas of dark green or black crystals. Gabbro is normally a 50:50 mix of dark and light crystals. It is not likely to be polished.</li><li>• <b>Schist</b> is a medium to coarse-grained metamorphic rock very similar in structure to slate. It can be easily distinguished from granite because it is made up of parallel layers and thus has a flaky texture. Schist differs from slate (which is also a metamorphic rock) because its grains are readily apparent under a hand lens, whereas in slate the grains are very fine and may not always be seen even when using a hand lens.</li><li>• <b>Gneiss</b> is another metamorphic rock but has coarser grains than schist. Like granite, gneiss is a compact rock, with medium sized grains (smaller in size than the crystals found in granite but larger than the grains in schist). The grains in gneiss are not randomly patterned – as in the case of granite – but appear in distinct bands. This banding has alternative layers that are made up of different minerals, and they can be quite irregular</li></ul>
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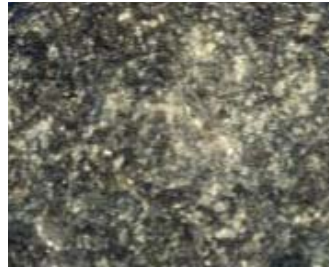
Polished granite surface



Unpolished granite surface



An example of a dolerite headstone



Close up of gabbro crystals



Banded gneiss

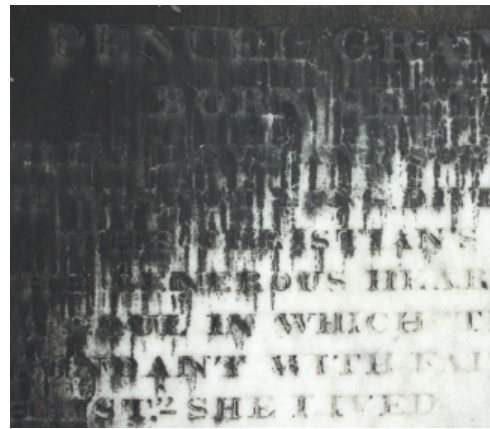


Schist

<p><b>Marble:</b>  is a <b>white stone with a sugary almost luminous appearance</b> and is commonly used in statuary and sculpture, as well as for gravestones. The term marble is normally used to describe any rock which is predominately made up of calcite (calcium carbonate). Calcite is white but minor impurities may result in coloured marbles (red, brown, grey or even black). White marbles are usually used for memorials and these may sometimes have grey coloured <b>mineral veins</b></p>	
<p><b>How marble looks under a hand lens</b></p>	<p>Marble's crystals are quite small and most easily seen using a hand lens. Under magnification these look like sugar or peppermint creams.</p>
<p><b>Colour</b></p>	<p>White marble is predominantly used for memorials, and greyish mineral veins often run through the stone.</p>
<p><b>Gravestone designs</b></p>	<p>Marble can be polished, however, calcite is slightly soluble in rainwater and so any polished surfaces tend to be short lived once a memorial has been erected in the graveyard.</p>
<p><b>Changes to marble in the graveyard</b></p>	<p>A pollution deposit can easily stain marble. Such deposits can disguise the true colour of the stone so that, in some cases, marble gravestones can look like they have been made from a naturally black or dark grey stone. Staining can often make the identification of stone type more difficult. In areas where a surface deposit is less dense, however, it should still be possible to see traces of a marble's white coloured crystals under a hand lens. Staining is less likely to affect any areas of recent damage, such as small chips along the flanks of the stone. It is also more difficult for discoloration to fully permeate any crevices. It is a good idea to check a stone's colour at the gravestone's joints if the memorial is made from more than one block of stone or is attached to a wall.</p>
<p><b>Stone types that can be mistaken for marble</b></p>	<ul style="list-style-type: none"> <li>• <b>Limestone.</b> Marble is limestone that has been affected by heat and pressure but these two stones can have very different appearances. Limestones are made from fragments of sea creatures or from algae muds and can often contain a high proportion of fossilised material. Another distinctive feature of some types of limestone are oolites. These are sphere shaped millet-seed-like grains that have been formed when dissolved lime builds up around sand grains. Although small, oolites can be seen with the naked eye. Limestones are found in a range of shades from light colours – including chalky white, light grey, buff, and pinkish white – to a dark charcoal grey. Unlike marbles, limestones never have a polished surface.</li> </ul>



Marble, here the formerly polished surface has become worn away



Marble partially covered by black pollution deposit (left)



Light coloured limestone



Limestone containing fossils



Dark grey limestone

<p><b>Sandstone</b>  is the most common type of stone used for gravestones. It is made from sand grains eroded from older rocks that have become stuck together. These rocks are predominantly made up of <b>quartz</b> grains (clear, white or greyish glassy crystals), which are bound together with a cement of silica, calcite or iron oxides, which gives the sandstone its overall colour.</p>	
<p><b>How sandstone looks under a hand lens</b></p>	<p>Grains are quite small and can be most clearly seen using a hand lens. Sandstone grains tend to be well sorted (i.e. the grains are all of a similar size).</p>
<p><b>Colour</b></p>	<p>The most common colours of sandstones are shades of buff, red or grey but occasionally some stones may appear almost white in colour.</p>
<p><b>Gravestone designs</b></p>	<p>Sandstone is worked to a flat, unpolished, even surface. It is relatively easy to work and therefore can be used for carvings in deep relief, which have elaborate detail.</p>
<p><b>Changes to sandstone in the graveyard</b></p>	<p>It is often easiest to recognise sandstone once its surface has begun to erode. At this point it most strongly resembles the appearance of sand as found on the beach or used in building work. Sandstone can be obscured by algae, lichen and pollution deposits, which can result in a dense, total coverage of the stone's surface.</p>
<p><b>Stone types that can be mistaken for sandstone</b></p>	<p>See earlier entries for <b>limestone</b>, <b>gneiss</b> and <b>schist</b>.</p> <ul style="list-style-type: none"> <li>• <b>Gritstone.</b> Although both gritstones and sandstones are made by cementing together grains of sand, their texture varies. The grains in gritstones are larger and more angular, whereas sandstone grains tend to be more rounded.</li> </ul>



This sandstone memorial is partially covered by a hard black pollution deposit (left). The original colour of the sandstone is visible in the central area where the surface has become eroded



Light coloured limestone



Banded gneiss



Millstone grit



Schist

## Slate

**General description:** Slate is metamorphosed mud and is very familiar because of its use as a roofing material. Slate headstones stand out in the graveyard because they are easily engraved to produce crisp sharp letting. Because of its multi-layered structure it is very uncommon for slate headstones to have decoration carved in relief (i.e. standing proud of the surface of the stone).

<b>How slate looks under a hand lens</b>	Grains cannot be seen without a microscope, although sometimes, as for other types of rocks, inclusions (such as minerals, pebbles and fossils) may be visible to the naked eye or under a hand lens.
<b>Colour</b>	Shades of medium to dark grey, often with a blueish or purplish hue are most common. Occasionally slate is green or buff coloured. Some slates may have light to dark brown streaks or inclusions.
<b>Gravestone designs</b>	Slate is worked to a very smooth flat unpolished surface. Carving tends to be shallow and remain crisp
<b>Changes to slate in the graveyard</b>	Slate can be obscured by algae, lichen and pollution deposits but unlike other stone types this does not usually result in a dense, total coverage of the stone's surface. Whilst slate gravestones have exceptionally smooth surfaces, as slate is a <b>foliated</b> rock, which splits easily into thin sheets, weathering may accentuate this structure.
<b>Stone types that can be mistaken for slate</b>	See the earlier entries for <b>schist</b>



Slate, in this picture the foliate structure is clearly seen



Schist