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Hydraulic Lime Stone & Brick Repairs

Introduction

An alternative to stone or brick replacement is what is termed plastic repair or lime mortar repair, which involves using a wet mix of lime binder and aggregates. The 'plastic' refers to the fact that the material is mouldable and can be placed and allowed to 'set'. Executed correctly, this type of repair blends in well with weathered masonry. It is mistakenly seen as a cheap option to stone replacement but the cheapness very often is associated with poor quality workmanship. When properly prepared and applied, plastic repair is not cheap and in certain circumstances can prove to be more expensive than stone replacement due to the amount of labour involved. This method of repair is best carried out by a qualified stonemason or conservator, who is familiar with the material. However, it may be sufficient that repairs can be carried out under their guidance.

An advantage of adopting this method is that it allows for more of the original fabric to be retained. Plastic repair is often used on moulded or carved detail. It can also be an effective form of repair on both ashlar and rubble walling. Cement must never be used for plastic repair.

Mixing

The preparation of mortar for repair must be carried out by a person, who is both experienced in the use of such material and familiar with the properties of its various constituents. When mixing, it is important to take into account resistance of the mix to wet and drying cycles and the strength required for a particular position of exposure. The strength of the mortar repair should be such that it always fails before the material it is repairing. A variety of sands, stone dusts and lime-fast and light-fast oxide pigments may need to be used to achieve the required colour. A number of samples may need to be produced and placed against the stone to achieve the correct mortar.

Application

- Before starting repair work, be fully aware of the causes of the damage and deterioration that you are seeking to remedy and make all efforts to reduce the causes of accelerated stone decay.
- Cut out the decayed area for repair and clean thoroughly. If removing vegetable growth using biocides check that these will not react with the mortar causing stains.

Disclaimer

Although we have taken great care to ensure that this information and advice is correct, we respectfully suggest that you take further advice to take into account site specific conditions. Therefore, we cannot accept any responsibility for any loss or damage in carrying out work using these guidelines.

- Before each coat of mortar is applied, if necessary, apply sufficient water to reduce excessive suction, especially on old bricks and porous stone. On many occasions this is done the day before, if necessary several times, with the last damping just before application starts. This will prevent water being drawn out of the mortar before it has had a chance to begin to cure properly and ensure that the applied mortar remains workable.
- Apply the repair in layers not exceeding 12mm, starting with a stipple or spatter dash coat providing sufficient bonding with the substrate, followed by successively weaker coats, finishing with an appropriately specified mortar to match substrate in colour, strength and texture.
- In all patch render repairs, coats should be applied firmly to exclude air and any excessive moisture.
- Hair or a man-made fibre can be added to all but the finishing coat.
- Each layer must be allowed to harden fully before applying the next layer.
- As in all layered lime applications, suction and mechanical key should be assessed and addressed between coat applications.
- Generally, where cavities exceed a depth of 50mm and extend over 50mm², an armature or anchor will need to be fixed into position constructed in stainless steel or a non-ferrous metal, onto which the repair mortar is applied. Holes are drilled into the stone and the armature fixed into position using epoxy resin. The holes should be dovetail shaped to ensure a durable fixing and then thoroughly cleaned before filling.
- The repair can either be finished directly or built up proud and worked back to a finish. It is important that the repair is protected from direct sunlight and other conditions that cause rapid drying.
- Normal aftercare to Naturally Hydraulic Limes rules apply. (See Aftercare Method Statement).

Plastic repair mortars should be comprised of appropriate aggregates, binder (Naturally Hydraulic Lime) and colour. To be successful the materials employed need to have certain characteristics;

- They should have physical characteristics similar to the host masonry.
- Have adequate bond strength.
- Have a good modulus of elasticity.
- Be vapour permeable.
- Be durable.
- Be capable of being dressed with similar tools to the original masonry.
- Remain workable long enough to allow details to be fashioned.
- Match in colour and texture.
- Adsorb water sufficiently in wetting and drying periods to match adjacent masonry.
- They must always be reversible.

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