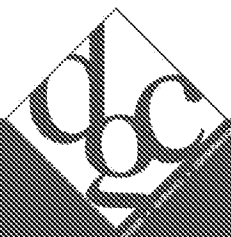


**SPECIFICATION FOR:
CONSOLIDATION & REPOINTING OF STONework**



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Repairing/Renovating Natural Stone Walling

Materials

All Natural Stone rubble on the site shall be re-used wherever possible, any additional stone to match existing and a sample submitted and approved by the Local Planning Authority prior to purchase.

All stone to be sound, clean and free from salt contamination.

Samples of stone shall be submitted to approved by the Contract Administrator before deliveries are made to site.

All stone shall be carefully stacked on site in accordance with good practice and in no circumstances shall they be tipped.

Old sound stones are to be properly cleaned removing all remnants of mortar as agreed with the Contract Administrator.

The Contractor and Contract Administrator are to confirm stones to be replaced in accordance with specification

The Contractor is to ensure that any new stone for repairs matches existing in colour, texture and size by taking dimensions prior to cutting out or, if missing, from adjacent bricks as agreed with the Contract Administrator.

The Contractor must ensure that all stone is laid in the correct bedding plain so as to ensure longevity of the repair/rebuild

Mortars

Hydraulic lime

Hydraulic lime shall be natural hydraulic lime, NHL3.5 or to BSEN459:1995 as appropriate

Lime Putty

Lime putty shall be high calcium white lime to BS890 matured for a minimum of 3 months, delivered in sealed containers and kept under water seal until required for use. Lime putty to be mixed with evenly graded sharp sand using a paddle mixer, or similar and approved and allowed to rest in air tight containers for a minimum of 14 days. At time of use the mortar is to be re-worked, using a paddle mixer or similar and approved until fatty. No additional water to be added as this will not improve the workmanship of the mortar, instead the mortar will be reduced in strength and could result in failure of the mortar.

Pre-mixed "coarse stuff" purchased from Chalk Down Lime or similar and approved can be used however the mortar should still be re-worked as previously described.

Mortar for bedding and pointing shall generally comprise:

1 : 2.5 : Lime Putty or NHL : Evenly graded Sharp Sand (not marine)

Type of lime to be agreed with Contract Administrator before commencement of the works.

Admixtures and masonry cement will not be permitted.

Sand

The sand for mortar shall be clean, naturally occurring sharp pit sand, or crushed rock or gravel in accordance with BS1200 well graded in the range 3.5mm to 75µ with a good proportion of sharp grit to aid adhesion. Sand should be washed clean of loam and clay.

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Water

No additional water should be added to the mix, the water leftover once the lime putty has been removed from the tubs can be applied to internal surfaces where decoration using limewash is required.

Cramps and Dowels

Copper alloy of grades listed in tables 8 and 12 of BS2780

Austenitic stainless steel sheet strip and plate to BS 1449 Part 2

Cramps to be screwed to face of timber posts and studs both sides of each panel to every third course of brickwork with stainless steel screws.

Samples

Samples of mixed aggregate shall be put forward for approval, and after agreement the mix shall be recorded and thereafter strictly adhered to unless varied by written instruction.

Make up samples of mortar for approval and carry out trial areas for experimental purposes. Allow to adjust, remake and agree as necessary with the Contract Administrator the details of the mortar. Allow to remove rejected samples and re-prepare for final work.

Workmanship

British Standard Specification and Codes of Practice

All works shall be carried out generally in accordance with British Standard Specifications and Codes of Practice.

Quality of Materials and Workmanship Standards

Only best quality materials are to be used strictly in accordance with British Standard Specification requirements. Substitute materials of a doubtful origin, materials that are not from sustainable resources, particularly where timber is concerned, are prohibited.

A high standard of workmanship is required. The Contract Administrator will closely scrutinise the quality of the workmanship employed on this contract and will not hesitate to condemn any work falling below the high standards that are to be achieved.

Sample Panels

Prepare sample panels to BS 3921, appendix F2 for each type of stonework, including jointing or pointing and obtain approval before proceeding.

Protection

Prevent damage to stonework, particularly arrises and projecting features. Protect with wooden slats, boards etc., securely fixed. Remove at practical completion. Prevent staining and other disfigurement of stonework during construction and by following trades.

Disposal

Dispose of all debris and unwanted material, cart away from site to an approved Local Authority site or other agreed by the Contract Administrator.

Taking Down / Cutting Out / Preparing Voids

Preparing records

Final agreement of areas to be repointed shall take place on site before work commences.

The Contract Administrator and Contractor will examine areas of rubble walling identified for rebuilding and clearly mark the extent of the repair.

Record photographically areas to be repointed / repaired showing:

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surrounding work
joint sizes
texture of pointing
style of dressing
any special or unusual features

Cross refer areas of repair on drawing, schedules or other to the Contract Administrator's approval.

Removing / Cutting Out Walling for Replacement

Cut out completely, to their full bed, stones identified for replacement. Adopt methods which will prevent damage to all surrounding work. Obtain Contract Administrator's approval.

Stones to be broken down using manual tools only. Power tools will not be permitted.

Inform Contract Administrator if movement is detected in adjoining work during the cutting out operations.

Removal / Taking down Walling for resetting

Rake out joints using a fine toothed mason's saw and hooked knife blade.

Lever stones from cavity position by whatever method necessary to prevent damage to the stone to be removed or the surrounding work.

Timber blocks may be used to temporarily support surrounding work.

Bring stones down to ground level and set aside for re-use.

Remove Existing Metal Fixings

Remove existing fixing using methods necessary to minimise damage to stone in which the fixing is attached. Do not damage or disturb surrounding work.

Preparing Beds and Backing

Ensure that all new stones are similar in size and shape to those being replaced for each cavity.

Remove all loose bedding and backing material, fixing, dowels, cramps and the like from the voids from which the stones are missing or have been removed.

Treat voids with biocides as specified.

Wash out void with clean water as specified.

Remove defective stone remnants, pointing, jointing and bedding material separated during cutting out operations and other unwanted materials off site to local Authority site.

Protect adjoining work, adjacent areas and open voids awaiting repair.

Resetting / Piecing in / Replacing

Transport stone with the least possible handling

Carefully stack and pack to guard against accidental damage. Packing materials will be dry to prevent staining.

Check stones delivered to site to ensure that they are undamaged and dimensionally similar to the existing.

Stonework is to be stored clear of the ground, kept dry and kept covered during winter months.

Ensure stonework is not soiled, chipped or contaminated in any other way whilst awaiting fixing.

Move and handle stones from storage adopting such methods as necessary to prevent damage being caused to the stones.

Ensure that the bond, joint size and any other special or unusual features are replicated in accordance with preparations records.

In walls which are faced on both sides build in bonding stones of sufficient length to tie facework into the core.

Flush out voids with clean water as specified to remove all loose material and reduce suction.

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Dampen stone for reinstatement / replacement. Spread a mortar bed on the stone and into the back of the void. Tamp the stone into position using the mortar as a lubricant for manoeuvrability. Pack mortar around the stone using a suitable pointing iron until a slightly recessed joint is achieved. Allow to set overnight before tooling back to expose aggregate where necessary

Repointing

Cut out joints using quirks, chisels and tooth masonry chisels. Cold chisels may wedge joints and should not be used. Mason's needle gun may be used with the Contract Administrator's written permission. Operators will have to demonstrate their competence using a needle gun to the Contract administrator's satisfaction. The vibratory pressure should be kept as low as possible and chisels very sharp. In all instances chisels will not exceed 12mm across the cutting face.

Joints should be cleaned out to a minimum depth of 30mm or not less than their width, whichever is greater. Wide joints, over 30mm should be cut to a minimum depth of 38mm. Where mortar has disintegrated and the joints are empty they should be deep tamped to fill the mortar joint to the required depth for pointing. If mortar, when tamped, finishes less than the required depth of cutting out for repointing, it should be cut back as necessary for repointing.

Impact, when cutting out should be at an oblique angle to the joint face, not direct into it. Great care should be exercised to avoid cutting out into the masonry or increasing the joint width. Cutting out should leave a clean square face at the back of the joint for optimum contact with the new mortar.

The joint should be carefully cleaned out with a bristle brush, adequately stiff to remove loose material, and flushed out with clean water. All loose material must be removed from the joints before filling can commence. This operation is to be carried out from top to bottom avoiding cross contamination.

Where the joints are colonised with algae or lichens, a biocide must be used on the dry surfaces during the cleaning out. Residue from the chemical treatment will be washed away with clean water, again working from top to bottom.

If the joints are dry they should be re-wetted before placing new mortar to prevent rapid drying out taking place.

The mortar is to be pushed into the joint from a spotboard and ironed in using the maximum possible pressure. Pointing irons are to be used to carry out this operation. Iron to be pushed into the joint particularly in irregular works, do not try and achieve compaction from the surface alone.

The mortar face should be filled slightly recessed, to avoid spreading mortar over the stone faces. Finished work should be protected from direct sunlight to avoid rapid drying.

Provide a weathered appearance to the exposed surface by tooling back and or stippling with a bristle brush to expose the aggregate after the initial set has taken place. Do not use a wire brush or scour or mark the final set.

Deep Repointing Joints Under Copings

Rake out joints, using methods necessary to prevent damage to the surrounding work to a minimum of 30mm to the full width of the coping bed, normally 600mm. Do not remove well attached material.

Remove loose deleterious material and dampen to reduce suction.

Allow to settle and repoint in a continuous operation.

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Push mortar well into the joint from both sides of the coping stone using suitable pointing irons until the stone is fully bedded over its entire area of contact with the wall. Do not allow the mortar to encroach over the arrises of the surrounding masonry.

Do not allow rapid drying of the mortar.

Finishing Joints

Set joint slightly back from stone face unless otherwise instructed by the Contract Administrator.

Where arrises are eroded set joint back to round edge avoiding the creation of ledges which may trap water. Where water may be trapped create a flaunch run off.

Match existing work by stippling with a wet bristle brush following the initial set of the mortar.

Wash surrounding work with clean water to prevent staining.

Consolidation Of Masonry – Lime Grout

Investigative works

Areas of bulging, cracking and displacement of stones to the facade to be recorded in accordance with Contract Administrators requirements.

All remaining areas to be sounded with a hammer to test for further hollows and recorded.

Prior to commencement of works, all areas to be agreed with the Contract Administrator and clearly marked on the masonry facade using a wax crayon or as otherwise directed by the Contract Administrator.

Disintegrated joints to be raked out and the mortar behind probed for voids.

Where necessary, and in agreement with the Contract Administrator select and mark face stones for removal to allow further investigation of the core.

Grouting

Prior to grouting flush out wall with clean water.

Introduce grout by one of the following methods:

a) Localised areas needing grout:

To be hand grouted using small clay grout cups ("swallows nest") formed in modelling clay against the masonry surface.

Pour grout into cup and allow mixture to disperse through the void around which the cup is formed.

Repeat as necessary until the level of grout within the cup is maintained. When set, break off cup and residue of grout from wall and brush the surface down. Cut out surplus grout to leave a minimal depth of 25mm for repointing.

b) Cracks requiring grout:

To be hand grouted using hypodermic syringes

Prior to grouting ensure that all loose debris is removed by either a soft bristle brush or where the crack is too narrow, by blowing. Crack to then be flushed out using clean water in accordance with the specification. Working from bottom to top, carefully inject grout into crack, removing any mixture that

stains the masonry surface and using a small clay cup at bottom of crack as previously described. When set remove clay cup and finish as described.

Repeat process working to the top of the crack after initial set of previous application of grout has dried.

c) Large voids:

Using working scaffold, construct framework to house gravity grouting apparatus consisting 2 No open galvanised iron pans with outlets in the bottoms, a union with a 38mm diameter galvanised pipe fitted to the outlet connecting to a 38mm diameter hose of sufficient length, terminating in a 18mm galvanised nozzle fitted with stopcock.

Each pan to be provided with wooden plug, or similar approved, approximately 450mm long to fit into the hole in the pan bottom and with a plunger in the form of a rubber cup to be used when the grout is flowing to remove air lock or other stoppages in the tube. Drill 25mm diameter holes into the mortar joints of the wall where voids have been located approximately 1000mm apart horizontally and 450mm vertically.

As the holes are drilled, thoroughly wash out with clean water, pouring in at the top until water runs out clear at the bottom, ensuring that all joints that leak be identified with a wax crayon.

All leaking joints to be tightly filled with clay pressed well into a depth of 40-50mm.

The nozzle of the delivery hose is then inserted into the lowest hole and plugged round with modelling clay or tow.

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