

C40 Cleaning masonry/ concrete

To be read with Preliminaries/ General conditions.

GENERAL/ PREPARATION

- 110 SCOPE OF WORK
- Sandstone masonry .
- 120 RELATED REPAIR AND REMEDIAL WORKS
- Work to be carried out before cleaning work: Pointing to cracks and joints in masonry, as section C41.
- 142 REMOVAL OF FITTINGS
- Timing: Before commencement of cleaning work.
 - Disturbance to surfaces: Minimize.
 - Items for disposal: as instructed.
 - Items to be kept for reuse: Free standing street sign.
- 160 PROTECTION
- Surfaces not designated for cleaning: Prevent damage, including marking and staining.
 - Openings: Prevent ingress of water, cleaning agents, and detritus.
 - Vents and grilles: Seek instructions before sealing up.
 - Temporary mechanical fastenings:
 - In masonry: Locate in joints.
 - In other surfaces: Seek instructions.
 - Additional protection: As drawing .
- 175 CONTROL AND DISPOSAL OF WASH WATER AND DETRITUS
- Disposal: Safely. Obtain approvals from relevant Authority.
 - Control of wash water: Collect and divert to prevent ingress and damage to building fabric and adjacent areas.
 - Above and below ground drainage systems: Keep free from detritus and maintain normal operation.
- 190 CLEANING GENERALLY
- Operatives: Appropriately trained and experienced for each type of cleaning work.
 - Evidence of training: Submit on request.
 - Control of cleaning: Confine cleaning processes and materials to designated areas. Prevent wind drift.
 - Detritus: Remove regularly. Dispose of safely.
 - Monitoring: Frequently check results of cleaning compared to approved trial samples. If results established by trials are not achieved, seek instructions.
 - Modifications to cleaning methods and materials: Seek instructions.
- 201 APPROVED STONEMASONS
- The work described in this section should be carried out by a qualified stonemason working for an approved stonemasonry sub-contractor whose name shall be supplied to the CA for approval before putting the work in hand.

211A REMOVAL OF SULPHATES AND SURFACE DEPOSITS FROM BALUSTRADE STONEWORK WALLING BEFORE PUTTING THE WORK IN HAND.

This is to be carried out to all stone faces where indicated on drawings

Water C40 256

Neutral soap C40 251

Recording C40 266

Preparation C40 272 - 279

Treatment C40 274 - 9

MATERIALS

251 NEUTRAL SOAP

Contractors choice to CA approval.

256 WATER

Clean tap water only.

WORKMANSHIP

261 SEQUENCE OF OPERATIONS

a) Inspection with CA.

b) Recording.

c) Preparation (including protection)

d) Treatment.

272 PREPARATION FOR WATER WASHING

Protection surrounding surfaces that could be damaged by the subsequent treatment, including temporary masking of adjacent openings to avoid ingress of water into the interior of the building.

Method of protection to be approved by the CA prior to commencement.

273 PREPARATION FOR WATER WASHING

Obtain CA approval to temporary protection.

carry out a trial cleaning (according to 274 - 279) to an area 1m² in allocation agreed with the CA and obtain approval to this prior to commencement. this trial sample will then be considered as a 'control' for the general standard of cleaning.

Provide wind protection and control waste as necessary.

274 TREATMENT WATER WASHING

Use fine spray nozzles at least 300mm away from the wall face to provide intermittent (or pulsed) nebulous (or atomised) sprays of water playing on the masonry surface.

The spray shall be controlled by hand pumps.

the washing interval will be controlled by hand pumps.

The washing interval will be initially established during the trial and may be varied as the washing is monitored but allow for ten second spray times interspersed by four minute drying periods until the deposits are loosened.

- 276 TREATMENT WATER WASHING
monitor the washing closely to ensure that enough water is applied to remove surface dirt but not saturate the masonry.
Inform the CA if stone is becoming saturated or the dirt is not responding to brushing.
- 277 TREATMENT WATER WASHING
Continue the washing and brushing until the agreed level of cleanliness is achieved or the agreed cycle is complete.
- 278 TREATMENT WATER WASHING
Arrange for CA to inspect when the above stage is reached.
Receive further instructions.
- 279 TREATMENT WATER WASHING
When it is agreed by the CA that washing is complete, remove all temporary protection, plugging or masking and clear all waste debris.

PRODUCTS/ EQUIPMENT

- 300 CONSOLIDATING SURFACE SCHEDULE OF OPERATIONS
- 315 GRAFFITI REMOVING POULTICE
This is to be carried out where noted on drawings.
Product name: FTP Powder Poultice
Manufacturer: Stonehealth Ltd, Bowers Court, Dursley, Glos, GL11 4JE (tel 01453 540 600)
Preparation: Pre wet surface.
Mix powder with water to make poultice.
Apply with trowel to a depth of 2-3mm
Cover in cling film.
Leave for 6-18 hours.
Remove and bag bulk residue.
Rinse remainder thoroughly, prevent water residues going to water course
Trial to be undertaken for approval in unobtrusive location prior to application proper.

MATERIALS

- 351A LIMEWASH / SHELTERCOAT
Refer to specification section M20/310A
- 356 WATER
Clean tap water only.
- 360 WORKMANSHIP

- 361 SEQUENCE OF OPERATIONS
 a) Inspect with CA
 b) Recording
 c) Preparation (including protection)
 d) Treatment.
- 371 REPARATION DRESSING OFF THE FACE
 Protect surrounding surfaces against damage and control dust and waste.
- 385 TREATMENT APPLICATION OF WATER
 Spray 10 applications on to surface of masonry.
 Use hand sprays on a fine mist setting.
 Saturate stones but avoid run off.
 Allow lime to dry between applications.

C41 Repairing/ Renovating/ Conserving masonry

To be read with Preliminaries/ General conditions

GENERALLY/ PREPARATION

- 100 REPAIRING / RENOVATING NATURAL STONE BALUSTRADE AND DRESSINGS,
 SCHEDULE OF OPERATIONS
- 101 APPROVED STONEMASONS
 The work described in this section should be carried out by qualified stonemasons working for an approved stonemason subcontractor whose name shall be supplied to the CA for approval before putting the work to hand.
- 102 GENERAL SEQUENCE OF REPAIRS TO BALUSTRADE
 1. Agree repair type with CA and photograph areas to be cut out.
 2. Defrass stone if to be retained as required and cut out renewals
 3. Remove cramps not to be retained.
 4. Treat cramps to be retained.
 5. Deep pint joints to face of defraced stone.
 6. Water clean retained stone.
 7. Carry out consolidation as required.
 8. Carry out repairs: Photograph areas to be repaired. Chose colour of mortar.
 9. Deep point joints for a depth of repair and grout voids.
 10. Apply colour wash to repairs and retained stone as required and carry out final cleaning.

- 106 REMOVE COPING STONework: REBUILD / REBED
 This is to be carried out to all existing stones where indicated on the drawings.
 Stone: existing
 Mortar: C41/221 for bedding and pointing, C41/233 for grouting voids.
 Recording: C41/306
 releasing: C41/311
 Preparing beds / backing: C41/316
 Preparation of stones: C41/321
 laying / bonding: C41/326
 Joint treatment / finish C41/331
 Grouting voids: C41/356.
- 110A **TYPES OF REPAIR:**
 USE/LOCATION: Pedestal plinths, pier dies, pier copings, balusters and baluster copings.
 REPAIR: General cleaning as C40/272 - 279, Stone replacement as specified and indicated on drawings, some indents.
 JOINTS: Point/repointed. Refer to Z21/111 for mortar mixes.
 the exact nature and extent of the works to column capitals etc will be determined when the work to each section has been commenced and close inspection made.
- CUT OUT DEFECTIVE BALUSTRADE STONework DRESSINGS/COPINGS (MOULDED OR CARVED) : INDENT NEW**
 This is to be carried out to all existing balustrade stonework dressings/copings indicated on the drawings.
 Stone; C41/201A
 Mortar: C41/222 for bedding and pointing, C41/222 for grouting voids.
 Recording: C41/306
 Cutting out: C41/336
 Preparing beds / backing: C41/316
 Dressing: C41/341
 laying/bonding: C41/326
 Joint treatment/finish: C41/331
 Grouting voids: C41/356
- 121 REMOVE CEMENT RENDER: CLEAN; DESCALE / DEFRASS DEFECTIVE ASHLAR STONework DRESSINGS: PREPARE: REMOULD DEEP MORTAR REPAIR PROFILE.
 This is to be carried out to all areas of moulded dressing where indicated on the drawings.
 Mortar: Slurry mix: C41/222
 Mortar: Repair mix (mouldings) : C41/222
 Recording: C41/306
 Remove cement renders: C41/406
 Average repair depth: 50mm (35mm - 65mm range)
- Mortar repairs: C41/431,436,461,466
 Armatures: C41/441
 Repair rendering: C41/446
 Repair texturing: C41/451
 Joint treatment finish: C41/456

- 125A REDUNDANT FITTING / FIXINGS
Items to be removed; as indicated on drawings.
Removal: Minimise disturbance to surfaces.
- 126 RAKE OUT: PREPARE; DEEP REPOINTING / GROUTING OF ASHLAR STONework / PACKING AND PINNING OF ASHLAR STONework JOINTS/CRACKS.
This is to be carried out to all stonework joints of fractures where indicated on the drawings.
Mortar: deep pointing: C41/222
Rake out lime mortar: C41/401
Remove cement mortar: C41/406
Joint treatment / finish: (Placing mortar): C41/456
Grouting voids: C41/356.
- 136 REMOVE FIXED ITEMS/REPAIR HOLE WITH LIME MORTAR
This is to be carried out where noted on drawings.
Recording: C41/306
Removal from walling; general as C41/125
Fill hole with lime mortar as clause C41/222
- 140 RECORD OF WORK
- General: Record work carried out to masonry clearly and accurately using written descriptions, sketches, drawings and photographs, as necessary.
 - Specific records: Photograph areas to be treated and cross referenced to drawing..
 - Documentation: Submit on completion of the work.
 - Number of sets: One.
- 141 TREAT FIXED ITEMS INSITU
Wire brush, treat with 2 coats Ferton Rust converter.
Ferton UK, King and Queen House, High Street, Hamble, SO31 4HA (tel 02380 456600)

WORKMANSHIP GENERALLY

- 151 REMOVAL OF CRAMPS BETWEEN STONES: RENEW
resin: C41/251
Sizes to suit lengths of cramps required. Carefully release existing cramp avoiding damage to adjoining stonework (with hand tools only) and set aside for recording.
Supply and fix new cramps made of 5mm and fix new cramps made of 5mm diameter stainless steel threaded bar bent to shape and insert 60mm in pre drilled holes.
fix new cramps with resin.
An insitu exemplar of this operation is located adjacent to the ashlar repair panel shown on the drawing.
- 155 PUTLOG SCAFFOLDING
- Usage: Not permitted.
- 155A TREATMENT OF EXISTING CRAMPS BETWEEN STONES.
If old cramps cannot be easily removed without damaging adjacent stonework, they are treated as C41/141.

- 161A REMOVAL OF ASSOCIATED FIXED ITEMS / MATERIALS: PREPARE; TREAT: REFIX
Recording; C41/306
removal from walling; generally as C41/125
Cleaning: Bead blast to C50B
Treat: 2 coats fertan as C41/141
Refix in walling: Run in lead or reset in lime mortar as clause C41/121 depending upon location and original condition to be matched.
- 170 DISTURBANCE TO RETAINED MASONRY
- Retained masonry in the vicinity of repair works: Disturb as little as possible.
 - Existing retained masonry: Do not cut or adjust to accommodate new or reused units.
 - Retained loose masonry units and those vulnerable to movement during repair works: Prop or wedge so as to be firmly and correctly positioned.
- 185 ADVERSE WEATHER
- General: Do not use frozen materials or lay masonry units on frozen surfaces.
 - Air temperature: Do not bed masonry units or repoint:
 - In cement gauged mortars when ambient air temperature is at or below 3°C and falling or unless it is at least 1°C and rising, unless mortar has a minimum temperature of 4°C when laid and the masonry is adequately protected.
 - In hydraulic lime:sand mortars when ambient air temperature is at or below 5°C and falling or unless it is at least 3°C and rising.
 - In nonhydraulic lime:sand mortars in cold weather, unless approval is given.
 - Temperature of the work: Maintain above freezing until mortar has fully set.
 - Rain, snow and dew: Protect masonry by covering during precipitation, and at all times when work is not proceeding.
 - Hot conditions and drying winds: Prevent masonry from drying out rapidly.
 - New mortar damaged by frost: Rake out and replace.
- 195 SAND SAMPLES
Approval: Before placing order, submit for approval representative samples of sand for bedding and pointing.
- 195A STONE DUST SAMPLES
Approval: Before placing order, submit representative samples of stone dust for limewashing and mixing of mortar.

MATERIAL/ PRODUCTION/ ACCESSORIES

- 200 WATER
Ensure that mains supply pressure is adequate for water spray system. If necessary pump water to maintain pressure.
- 201 STONE
Balustrade, dressings mouldings and carved for renewal generally.
Type and source: Ancaster Hard White Sandstone.
- 211 SURFACE TEXTURE DETAILS
Generally provide samples of new stone to match existing for approval of CA showing any surface texture, finish of special detail. Once approved this sample will be used as a model standard.

- 220A AGGREGATES FOR MORTAR
Are to be crushed stone, stone dust and well graded sand. Select for colour and texture to match the existing stone bedding material. See schedule of works for sample requirements. Aggregate sizes to vary according to the mortar used.
- 221 MORTAR
Measure material by volume using clean gauging boxes.
Portions of mixes of dry sand. Allow for bulking if sand is damp.
Mix ingredients thoroughly to a consistency suitable for the work and free from lumps.
Use mortar within four hours of mixing at normal temperature.
Do not use after initial set has taken place and do not retemper.
Keep planks and banker boards clean at all times.
Do not use additives other than those specified without the permission of the architect.
Refer to Z21
- 235 INSPECTION OF MASONRY UNITS
General: before despatch to site, inspect and check completed units for;
match with approved samples.
Compliance with drawings and specification.
Give notice; at appropriate stages in production to allow inspection of masonry units before delivery to site.
- 240 STONE
 - Supplier: William Anelay Ltd .
 - Type: Ancaster hard white sandstone .
 - Quality: Free from vents, cracks, fissures, discolouration, or other defects that may adversely affect strength, durability or appearance. Thoroughly seasoned, dressed and worked in accordance with shop drawings prepared by the supplier.
 - Finish: To match existing.
- 245 REPLACEMENT STONE UNITS
 - Sizes and profiles: To match existing masonry. Maintain existing joint widths.
 - Sinkings for fixings, joggles and lifting devices: Accurately aligned and positioned in relation to existing masonry.
 - Marking: Mark each block/ dressing clearly and indelibly on a concealed face to indicate the natural bed and position in the finished work.
- 250 STONE ORIENTATION
 - Orientation of natural bed:
 - In plain walling: Horizontal.
 - In projecting stones and copings: Vertical and perpendicular to wall face.
 - In arches: Perpendicular to line of thrust.
- 251 RESIN
For piecing in and fixing cramps, armatures etc.
Type: Acrylic resin
Manufacturer and reference: Sebralit Solid
Source: Contractors choice.
- 255 ASHLAR BLOCKS/ DRESSINGS
 - Cutting and dressing stone: To true and regular surfaces, free from hollow or rough areas.

256 PINS
Stairib 460 Deformed Round Bar 6mm diameter in grade 18/8 Austenitic Stainless Steel 460 Nmms complies with BS6744:1986. Spec 304531 By George Clark (Sheffield) Ltd or similar supplier approved by the CA.

257 STAINLESS STEEL DOWELS
Round bar 20mm diameter in grade 316 Austenitic Stainless Steel 460 Nmm2 complies with BS6744:1986.

DISMANTLING/ REBUILDING

306 RECORDING STONework
The schedules refer to take down and rebuild or to build up to match existing/adjacent areas.
All areas are to be fully recorded by the contractor using photography and marked up record drawing prior to taking down, noting position of stones, the nature and style of the balustrade and style of the bedding and pointing.
All materials resulting from taking down operations are to be carefully handled, salvaged stored on site. They will remain the property of NML until such time as they are instructed specifically for disposal.
Following inspection with the CA mark out area to be treated on site and transferred onto record drawing. Photograph areas to be treated and cross reference photos to record drawing.

311 RELEASING STONES
Release stones by cutting out jointing material, cutting through anchors, fixings and the like and easing/levering stones from their backing, by adopting such methods necessary to prevent damage to stones being removed and surrounding work:
Use many tools only, i.e. chasing chisels and hacksaws. Power tools will not be permitted:
lay dust by adequate sprinkling of water;
Notify the CA of any signs of structural movement found within the balustrade when stones have been removed.
number individual stones in clean water, scrub off dirt, etc. Set out on adjacent decking.

316 PREPARING BEDS/BACKINGS GENERALLY TO RECEIVE NEW WORK.
thoroughly clear out void using hand tools and brushes.
Treat voids with biocide as C40A
Temporarily support surrounding work.
Cut out and remove, label and set aside in store existing corroded cramp/cramps from stone and bed.
provide new stainless steel cramps to match those removed and fix.

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321 PREPARATION OF STONES
Thoroughly clean stones set aside/stored for reuse to the approval of the CA removing any remaining adhering mortar.
Move and handle stones, loading, unloading, and lowering or hoisting into position by adopting such methods necessary to prevent damage to stones.
Provide to masons copies of all photographs, records etc necessary for the accurate resetting on the stones.

326 LAYING AND BONDING

In the exact position as previously occupied by the (original) stones and as recorded. Ensure that bond, joint size and any special or unusual features are replicated as recorded and to match existing.

provide and insert stainless steel ties; cramps and dowels as necessary for bonding in the rebuilt work to the surrounding structure.

Clean out and flush out or moisten with clean water voids left after removal of stonework (preparation of void) to remove dust and reduce suction.

Dampen stones to be reset/rebuilt and tamp into place on a full and even bed of mortar, including any necessary temporary support shims (i.e. lead or slate).

Pack remaining joint with mortar using a rammer and pointing key.

336 CUTTING OUT: COMPLETE STONES FOR INDENTS.

Cut out single defective stones or group of stones to 125mm depth measured on bed by adopting such methods necessary to prevent damage to surrounding stonework, starting from the centre and working outwards.

Having drilled the whole face of the stone at 50mm horizontal and vertical centres to the required depth using manual tools only, i.e. bolster and chistle.

lay dust by adequate sprinkling of water;

Notify the CA of any signs of structural movement found within the walls when stones have been removed.

337 CUTTING OUT COMPLETE STONES AND/OR PREVIOUS INDENTS

Cut out single defective stones or groups of stones, or prevent indents, to their full bed by adopting such methods necessary to prevent damage to surrounding stonework, starting from the centre and working outwards. Use manual tools only i.e. bolster and chistle, unless otherwise agreed with CA before commencing work.

Ensure dust is controlled

Provide temporary support to area being worked on.

Notify the CA of any signs of structural movement found within the walls when the stones have been removed.

341 DRESSING

Finish new stones on all exposed faces to achieve a finish to match the original finish of existing stonework, to the approval of the CA.

Form all chamfers, mouldings, stoolings, shaped arises, and other labours to match dimensions taken from site.

Provide alternative tooled finish to replace stones if required by the CA.

No artificial distressing.

Carve to accurate clean profiles before or after building in as agreed.

Carve to date to selected replaced stones in a style/manner as approved by the CA.

346 RELOCATE/PROTECT.

Provide temporary protection to item to be relocated to prevent damage.

Provide adequate mobile lifting apparatus to take the weight of the item to be relocated.

Carefully lift and move item to new location as shown on the drawing and set down in final position (either for storage or preparation for refixing).

- 351 **REFIX**
Provide new stainless steel fixings to substitutes existing.
Re-set stone item in new location generally as C41/326
Grout all voids as C41/356
Remove temporary protection.
- 352 **PLINTH BASE COURSE AND ASHLAR WALL REPAIRS**
Existing defective stones are to be cut out from the centre towards the edges to avoid damaging the arises of adjoining stones.
New stone should ideally be at least 100mm on bed. Thinner stones to be mechanically fixed.
- 354 **PREPARING BEDS/BACKINGS GENERALLY TO RECIEVE NEW WORK OR RESET STONES.**
Thoroughly clear out voids using hand tools and brushes.
Treat voids with biocides as specified.
Temporarily support surrounding work as method to be agreed with CA.

- 385 **LAYING REPLACEMENT MASONRY UNITS**
- Exposed faces of new material: Keep to agreed face lines.
 - Faces, angles and features: Align accurately. Set out carefully to ensure satisfactory junctions with existing masonry and maintain existing joint widths.
 - Joint surfaces: Dampen to control suction as necessary.
 - Laying units: On a full bed of mortar, all joints filled.
 - Exposed faces: Keep clear of mortar and grout.

MORTAR REPAIRS GENERALLY

- 401 **RAKE OUT LIME MORTAR JOINTS**
Rake out well to a depth of 35mm using chistles or hacksaw blades of appropriate width so as not to damage existing arisesb and flush out with water.
- 406 **CEMENT REMOVAL**
Remove cement patch repairs to rustication and ashlar using hand tools. This is best achieved by continual gentle tapping with a hammer at the centre of the repair until the different mechanical properties between the stone and the cementicious mix causes the two to part without damage. The process is lengthy and time should be allowed for it. Care is to be taken to avoid damage to the stone substrate, particularly where the repairs are deep and welladhered.
Avoid damage to edges of surrounding stone.
Remove cement pointing by using hand tools such as quirks or narrow chistles. Clean out joints using dry air sprays and non ferrous or stiff brtstle brushes.
- 411 **SURFACE CLEANING READ IN CONJUNCTION WITH C40**
Pre clean all retained work revealed to such standard to match surrounding cleaned work. Carry out consolidation as C40/300 and inspect with CA to agree exact areas to be repaired.
Friable stone faces should be descaled and defrassed and a key cut where necessary using hand tools. Undercut top edges to protect feather edges from weather.

416 REPAIRS

The area to be repaired should be well whetted and particularly friable stone should be treated with 3 coats of slurry mix.

Water is added to this mix to achieve a thin creamy consistency.

Brush on the slurry coat and work well into stone. Allow to tack dry before applying second and third slightly thicker coats.

426 SLURRY MIX

A coat of slurry mix is to be applied immediately prior to mortar repair and allowed to dry tack.

431 APPLICATION OF MORTAR REPAIR

Repair mortar should be as dry as possible. Repair to be applied using small trowels and spatulas to a depth of no more than 12mm per application.

Repairs to be tended between applications and each stage allowed to go off to a leathery consistency but still green before application of the next coat.

Repairs to be tapped by hand to establish any areas of failure. Each stage must be sound before work can continue.

Repairs to be kept damp and protect from frost, wind and direct sunlight to prevent rapid drying out and subsequent cracking, shrinking, and failure. Use damp hessian as protection.

Particular attention needs to be paid to overnight protection.

436 APPEARANCE

Modeling, finish and texture of repairs: care to be taken over final tending and finishing off. Texture repairs to match adjacent stonework by working over with hessian, spatulas, plaster modelling and sculptured tools to the approval of the CA.

Repairs to balusters require a high degree of sculptural skills, experience and a finely tuned eye to achieve good results. It is very important that care is taken over accuracy of dimensions, cleanness of line and overall final appearance in order to produce a satisfactory and successful repair. The conservator must be able to stand back and look at the work in overall context. It must look appropriate from every angle and in its overall context.

441 MORTAR REPAIRS ARMATURES

Drill at 50mm centres, vertically and horizontally, 5mm diameter holes and insert stiff stainless steel wires (C40G:M035) twisted to a spiral up 25mm in diameter. Ensure that surfaces of the armature is 10 - 13mm below the final surface. Do not use armatures on a single coat work. Increase the gauge of the wire and if necessary the whole size of the armature for deeper repairs such as that the armature remains moderately rigid.

442 LIME MORTAR REPAIRS

grout fine cracks and concealed hollows identified in stoneworks. Apply grout with syringes where restricted. Fill cavities and cracks with mortar in layers of no more than 6mm thick. Build up layers of mortar to flush with surface of adjacent stonework, but do not attempt to recreate mouldings. Mortar should be well compressed. Treat deep cavities with slurry of repair mortar prior to filling. protect the layers against wind and sunlight to ensure that repair remains damp for at least 3 days. Cover the repair with damp cotton wool wads and hessian sacking.

443 MORTAR REPAIRS TO STONE FACE - PREPARATION

The area to be prepared should be well wetted and particularly friable stone should be treated with 3 coats of slurry mix.

Add water to the mix to achieve a thin creamy consistency for the first coat.

Brush on the slurry coat and work well into the stone. Allow to take dry before applying second and third slightly thicker coats.

444 MORTAR REPAIRS TO STONE FACE - APPLICATION OF REPAIR MORTAR.

Repair mortar to be applied using small trowels and spatulas to a depth of no more than 12mm per application.

Repairs to be tended between applications (NBS C41/446) and each stage to go off to a leathery consistency and not harden) before application of the next coat.

Repairs to be tapped by hand to establish any areas of failure. each stage must be sound before work can continue.

Repairs to be kept damp and protected from frost, wind and direct sunlight to prevent rapid drying out and subsequent cracking, shrinking and failure. Use damp hessian as protection.

particular attention needs to be paid to overnight protection.

445 MORTAR REPAIRS - TEXTURING AND APPEARANCE

Unless otherwise directed texture mortar repairs to match general level of decay of surrounding stone.

Modelling finish and texture repairs: care to be taken over final tending and finishing off.

Texture repairs to match to match existing stonework by working over hessian, spatulas, plaster modelling and sculptured tools, to agreed samples.

Patination using natural pigments, including charcoal bound by casein in a solution of water, to be agreed with the CA.

446 MORTAR REPAIRS - TENDING

Tending is the key to successful mortar repairs.

Lime mortars only carbonate in the presence of water.

This should happen over a period of at least 10 days. It is imperative to control the rate of drying out and adjust it to ambient environment to ensure consistency.

allow for programme implications, especially for deep mortar repairs, of the time required.

tend by: Protecting each mortar repair with damp hessian and polythene in warm drying conditions, and damp hessian and bubble wrap in winter. Ensure that mortar repairs are fully protected for four months after application in winter working conditions. Check repairs at regular intervals and spray with clear limewash to keep damp. Avoid and take care not to allow run off as lime mortar causes stains which are invisible until they have dried out.

Carry out any texturing of keying on deep coats before final set or 'turn'.

451 MORTAR REPAIRS - TEXTURING.

Unless otherwise directed texture mortar repairs to match the general level of decay of surrounding stone.

A mortar repair should blend into the stonework when viewed from more than 1.5m. The degree of texturing will be determined in conjunction with the CA.

456 JOINT REINFORCEMENT / FINISH:ASHLAR REPAIRS

All original joint lines are to be maintained.

Deep pointing mortar to be applied with a mortar gun, and well packed in to the joints, leaving a square face 20mm from final surface.

Apply final pointing using fine pointing tools. take great care to avoid lime staining to the ashlar. joint lines to ashlar repairs should be kept, and pointed as for sound stone.

Protect pointing and tending as for mortar repairs.

It is impractical to cut mortar joints out after mortar repair has been completed.

461 MORTAR GENERALLY

A palette of mortars shall be prepared from the base mixes. Colours should be adjusted as necessary using more or less strongly pigmented aggregate and charcoal. Artificial pigments must not be used.

466 MORTAR REPAIRS MIXING AND STORING.

To be confirmed by investigation works but generally as Z21.