Standard Specifications

for

Ashton Old Baths

ASHTON-UNDER-LYNE, MANCHESTER

May 2014

FOR: PLACE FIRST

STEPHEN LEVRANT HERITAGE ARCHITECTURE LTD
Barnett House, 53 Fountain Street, Manchester, M2 2AN
T 0161 247 8335
J22  FELT MEMBRANE  

BUILDING FABRIC SUNDRIES  
P21  IRONMONGERY  

DISPOSAL SYSTEMS  
R10  RAINWATER PIPEWORK AND GUTTERS  
R11  FOUL DRAINAGE ABOVE GROUND  

BUILDING FABRIC REFERENCE SPECIFICATION  
Z10  PURPOSE MADE JOINERY  
Z11  PURPOSES MADE METALWORK  
Z12  PRESERVATIVE/FIRE RETARDANT TREATMENT  
Z20  FIXINGS, ADHESIVES  
Z21  MORTARS  
Z22  SEALANTS  

ASHTON OLD BATHS  
May 2014
INTRODUCTION

Ashton Old Baths (Ashton-Under-Lyne, Henry Square)

Ashton Old Baths is a Grade II * listed building, by Paul and Robinson, 1870-1. Built in Italian Romanesque style as a public baths, the building combined a swimming bath, private baths, a washing shed and a shed for a fire-engine, a Turkish bath.

Listed Building description:

IoE number: 212657

"ASHTON-UNDER-LYNE HENRY SQUARE SJ 99 NW (south side) 4/9 Hugh Mason House (formerly listed as The Municipal 2/4/75 Baths) G.V. II* Municipal swimming baths, now industrial/office units. 1870-71 and later. By Paull and Robinson. Flemish bond brick with slate roof and stone dressings. Large swimming hall with tower at north east and subsidiary accommodation at east. Italian Romanesque style. 5-bay swimming hall has flat pilasters, a machicolated frieze below the eaves level and 3 round-headed windows with hoodmoulds and glazing bars in the upper storey of each bay. Other elevations are treated similarly. A lean-to against the ground floor has a central entrance feature with 2 arched door openings and numerous small arched lights under dripmoulds. The Lombardic tower has vent openings towards the top between bold machicolations. A similarly detailed chimney rises from the apex of the roof. To the left of the tower another elaborate entrance surround gives access to the lower 2-storey wing which has paired windows on the lower floor and 11 round windows on the first floor. Interior: the swimming pool (at the time said to be the second largest covered bath in Europe) now filled in, is surrounded by paired columns with moulded capitals supporting semi-circular brick arches. Impressive hammer-beam roof. Other fittings, including doors, staircases etc. have survived intact. Apart from being an important early example of a Municipal swimming bath the building is exceptional because of its forceful architectural massing and use of stylistic features."

The Purpose of Conservation

The Clients are undertaking works to safeguard the fabric through the necessary measures to prevent further deterioration.
STANDARD BRIEF

4.0 The Standard Specification

4.1 This Specification is based upon the format of the NBS Specification, Intermediate Version which relates to the Intermediate Form of Contract 84. The full document was prepared for The Crown Estate's Regents Park Estate by PMT Architects to whom acknowledgement is gratefully made. The present document has been altered and adopted by Stephen Levrant Heritage Architecture Ltd for use only in this project. This Specification must be read in conjunction with the Schedules of Works and Drawings.
C30 SHORING AND SUPPORTS

To be read with Preliminaries/General conditions.

C30/111. GENERALLY: Before starting work:
- Examine all available information.
- Survey the structure, site and surrounding area.
- Submit method statements to the CA and PM, covering any relevant matters raised in the design brief.
- Ensure that all statutory notices have been given and licenses obtained.

C30/121. COMMENCEMENT CONDITION SURVEY:
- Before starting work, survey the existing state of structure to be kept in place to locate and record the magnitude and extent of all cracks, spalling, flaking and other irregularities of the fabric.
- Agree the commencement condition survey record with the CA.

C30/131. RETENTION OF STRUCTURE:
- Where structure is to be retained, agree details of supporting structure and structural monitoring procedures with the CA and SE.

C30/210 WORKMANSHIP:
- Carry out work in accordance with the design brief, Health and Safety Executive Guidance Note GS51, BS 8004, section 9.7 and generally in accordance with BS 5975.
- Operatives must be appropriately skilled and experienced for the type of work and hold or be training to obtain relevant CITB Certificates of Competence.
- Site staff responsible for supervision and control of the work is to be experienced in the methods of erection and maintenance of support systems to be used.

C30/231. UNKNOWN HAZARDS: Inform the CA and PM of any unrecorded voids, flues, services, etc. discovered during erection of support systems. Agree with the CA methods for infill, making good, relocation of support connections, etc.

C30/231. LOADING AND MAINTAINING SUPPORT STRUCTURES:
Agree with the CA, SE the method statement for the loading and maintaining of support structures.

C30/421. COMPLETION CONDITION SURVEY:
- After disconnection of support systems, allow for survey and record the state of structure kept in place, by others
- Ensure that all defects caused by or due to support systems have been remedied.
- Agree the completion condition survey record with the CA and PM.

C30/431. MAKING GOOD: Repair any connection holes made in the structure kept in place with methods and materials as agreed with the CA.
C30/440 COMPLETION: Clear away all support systems and leave the site and any working areas beyond the site boundary in a tidy condition on completion.

C35 STRUCTURAL REPAIRS

See provisional sums. Allow for inspection and instruction by SE on site.

C35/105. Provide Method statement as requested by SE.

C40 CLEANING AND REPAIRING BRICKWORK

To be read with Preliminaries/General conditions.

C40/100. BRICKWORK: refer to section F10 for materials and workmanship generally in connection with brickwork and Section H71 for materials and workmanship in connection with leadwork.

C40/103. RECLAIMED BRICKS: facing bricks reclaimed from demolitions and cutting away on the site will be approved for re-use only if they are free from fungus, have no deep or extensive cracks, or damaged corners or arrisses, and are free from old mortar.

C40/104. RECLAIMED BRICKS: must be suitable and fit for purpose. Internal bricks, or others of inferior quality must not be used on exterior work.

C40/111. SAMPLES: obtain samples of facing bricks and voussoirs to be used in external brickwork to CA’s approval; keep samples on site.

C40/112. CONTROL SAMPLE PANELS: prepare sample panels of brickwork and pointing to match existing as required by the CA, for approval by the CA. Keep on site until completion of the Works or until instructed to remove by the CA. Give notice to CA of the removal of any sample panels.

C40/121. MORTAR: to be as specified in Section Z21.
- Ensure that the mortar for the repair is the same strength or weaker than the existing.

C40/121. EXISTING MORTAR SAMPLES: in cases of fine brickwork, take samples of mortar as directed by CA for analysis by others; record positions of each sample.

C40/131. CLEANING: the method of cleaning brickwork depends upon the degree and cause of the soiling.
- Contractors must be experienced in cleaning historic buildings.
- Present details of soiling and proposals for cleaning to CA for approval before commencing any work.
- Proposals must included details of collection of run-off and disposal/recycling of dirty water.

C40/132. CLEANING: comply with section 1 of BS 6270: Parts 1 and 2 in respect of:
- means of access;
- protection of building fabric, external and decorative fixtures;
- protection of operatives, building users and public.

C40/137. SURFACE REPAIR: comply with the general requirements of BS 6270 and use the particular method of repair specified in the Part and Section of BS 6270 stated below for the surface repair of:
- mortar joints (Part 1, Section 3, paragraph 13)
- brickwork (Part 1, Section 3, paragraph 14.3)

C40/141. BRICK TIES: ensure that the inner and outer skins of brickwork are properly bonded together; carry out remedial work as necessary using a suitable method of non-ferrous ties. Agree method with CA

C40/143. BIOCIDES FOR ALGAE AND LICHEN: apply a biocide as approved by the Advisory Committee on Pesticides following Health and Safety Executive guidelines and COSHH Regulations.

C40/145. MORTAR STAIN CLEANING AGENT
- “Sealoclean”
- Manufactured by Sealocrete PLA Ltd,
  Greenfield Lane, Rochdale, Lancs OL11 2LD
  Use in accordance with manufacturer’s instructions.

C40/147. ACCURACY: keep courses level and perpends vertical and in line with existing courses; plumb all wall faces, angles and features. Adjust joint thicknesses to match the existing.

C40/150. SET OUT repairs carefully to achieve satisfactory junctions with existing brickwork / elements.

C40/152. BOND: repairs are to match the existing bond. Additional ties / reinforcement are to be inserted to ensure patched brickwork is securely integrated.

C40/154. BOND: unless stated otherwise 112 mm walls are to be in stretcher bond, and other brickwork in Flemish bond.

C40/156. BACKING BRICKWORK to faced walls is to be in the same bond as the facework.

C40/158. LAY FACING BRICKWORK to be pointed later on a full bed of mortar and fill all frogs and joints; rake out to C40/240 as the work proceeds.

C40/160. LAY FACING BRICKWORK on a full bed of mortar and fill all frogs and joints; strike off joints as the work proceeds; tamp lightly with a stiff bristle brush when nearly dry to match weathered pointing.

C40/162. LAY GENERAL WALLING brickwork on a full bed of mortar and fill all frogs and joints; strike off joints with a trowel as the work proceeds.

C40/164. FROGS: lay single frogged bricks frog uppermost and double frogged bricks with the deeper frog uppermost.

C40/200. REPAIRS: agree the extent of all brickwork repairs with the CA before starting any cutting out or repointing.

C40/210. STITCHING: carefully cut out bricks as indicated by CA / SE:
- remove all mortar from all faces of the hole. Do not damage the arrisses of the retained brickwork.
install reinforcement / ties in accordance with Particular Specification
fill hole with facing brickwork to match existing
point to match in with the wall.

C40/220. REPAIR OF GAUGED BRICK ARCHES is to be carried out by a qualified craftsman bricklayer experienced in repair/renovation of historic gauged brickwork.

C40/225. REPLACEMENT OF GAUGED BRICK ARCHES using arch sets
- Install temporary centring
- carefully dismantle the whole arch, setting aside any undamaged voussoirs for re-use in new arch set by specialist manufacturer
- remove section of brickwork above existing timber lintels and cast in new reinforced concrete lintel as described in Section E, with cast in brick ties to Structural Engineer’s requirements.
- check that the arch set the arch set is the correct one for the particular opening
- bed voussoirs to designated pattern, using lime putty between them and bedding mortar behind them, ensuring that brick ties are in the correct position
- point using method C40/245 if required.

C40/230. REPAIR OF GAUGED BRICK ARCHES using whole voussoirs
- install temporary centring as necessary to support existing and new voussoirs
- carefully cut out damaged voussoirs
- bed new voussoirs with lime putty between them, and bedding mortar behind
- point with lime putty as C40/245

C40/235. REPAIR OF DROPPED VOUSSOIRS: where one or two voussoirs have dropped but are still sound
- clean off the remaining mortar using a purpose made or hacksaw blade
- ease the bricks back into position
- wedge with a sliver of lead or slate
- point in lime putty as C40/245

C40/240. KEYED POINTING: rake out joints to a depth of 20 mm as the work proceeds. Point and form joints to approved profile with mortar in a continuous operation as scaffolding is taken down.

C40/245. FINE POINTING: gauged brickwork and other fine joints
- lay a strip of carpet tape over the joint to be pointed
- slit the tape into the joint with a sharp knife, and press the edges of the tape into the cut
- point with mortar mix as Section Z21
- press the mortar home with a pointing key until the joint is full
- strike off and peel off the tape.

C40/250. RE-POINTING:
- clean out joints to a minimum of 25 mm using hand, not power tools
- Do not use angle grinders for cutting back joints
- tamp or hand grout empty joints with mortar to a depth of 25 mm from the face of the masonry
- clean the prepared face using a bristle brush
- flush the joint out thoroughly with clean water, taking care to avoid saturation
- remove all dust and loose material working from the top to the bottom of the wall.
- Lightly wet the joints and point neatly in the appropriate mortar mix from Section Z21, and strike off flush.
- Tamp back with a stiff bristle churn brush after the initial set has taken to leave a slightly textured finish.
C40/256. ALGAE AND LICHENS: Remove any algae or lichens found in old weathered joints using a biocide as described in clause no. C40/143 following the manufacturers recommendations.

C42 CLEANING AND REPAIRING STONE

- To be read with Preliminaries/General conditions. In accordance with the schedule and any marked up drawings.

C42/100. STONEWORK: refer to section F21 for materials and workmanship generally in connection with stonework and section H71 for materials and workmanship in connection with leadwork.

C42/101. CAST STONE is only to be used where the use of natural stone is impossible, and with the prior consent of the CA. Cast stone to be generally in accordance with BS 1217:1997.

C42/102. ARTIFICIAL STONE REPAIR or ‘PLASTIC REPAIR’ or “COSMETIC REPAIR” may be used only with agreement of CA, and for repairing defect smaller than 100 mm/any direction. Pins and/or wires may be used where appropriate. Provide samples of stone dust mortar mix for approval. If during the preparation work excessive depth of decay is found then consideration must be given to replacing the affected masonry with new materials. (See C42/200). Agree with CA, QS and PM the nature and amount of additional work to be carried out.

C42/110. APPROVED FIRM: employ an approved specialist firm in compliance with A30/661. for ashlar stone repairs. The name of the proposed sub-contractor must be submitted to CA, supplying evidence on demand of the sub-contractor’s experience in the repair/renovation of historic stonework.

C42/120. PROVIDE DETAILED workshop drawings for all replacement stone profiles, sections and fixings; and submit to CA for agreement prior to the commencement of any works.
- base drawings on surveys and templates taken from least weathered areas at points agreed on site with the CA.
- Do not damage existing sound work whilst taking the templates.

C42/130. CLEANING to be carried out in accordance with the specification for cleaning of masonry section C40/131, 132.

C42/140. CLEANING comply with the general requirements of BS 6270 and use the particular method of repair specified in the Part and Section of BS 6270 stated below for the surface repair of stonework (Part 1, Section 3, paragraph 14.2)

C42/170. COPINGS
- work coping stones to match existing profiles
- Stones to be rubbed and throated in lengths to match the original.
- Knee and bend stones to be solid as existing.

C42/180. IRON CRAMPS: inform the CA when iron cramps are encountered during the repair works
- carefully remove all rusting cramps, dowels and any associated lead flashings etc.
- Replace with non-ferrous fixings to CA direction.
- Remove any loose or friable materials from sound cramps with a wire brush and treat with a suitable rust inhibitor.
C42/190. STONE TO BE REINSTATED
- make a note of the position of all stones to be removed and reinstated
- mark in indelible marker
- cut out the perimeter joints with a purpose made fine saw blade
- carefully set aside and store as for new stone
- re-fix stones in their exact positions and proper beds.

C42/200. CUT OUT defective stones to 100 mm on bed or to sound stone, whichever is the deeper, or other depth agreed with the CA
- cut out perimeter joint with a masonry saw, take care not to damage the arrisses of the surrounding stones
- break down the stone with vertical saw cuts or hammer and chisel.

C42/210. TEMPORARY SUPPORTS; allow for temporary supports and centring to SE’s approval and in accordance with the Health and Safety plan.

C42/220. CUT OUT for piecing in using a small sharp chisel and small saw blades to a neat square profile

C42/230. TOOLING BACK: dress back friable, loose or flaking stone to a firm edge
- leave without pockets or ledges to catch rainwater

C42/240. PREPARATION OF BACKGROUND for the replacement of new or retained stones; clean out the cavity or open bed of all loose and friable material
- spread mortar bed in accordance with Particular Specification/Schedule onto the wetted old stone
- do not saturate the cavity
- re-fix the stone with joint width to match existing

C42/250. POSITIONING AND GROUTING; dampen new stone and handle into position
- ease in correct alignment on the bed of wet mortar
- pack up with lead or slate shims for temporary support for very heavy stones
- stop up the bed joint and perpendicular joints at the surface; leaving openings for grouting
- grout with mortar as Section Z21
- avoid staining of the stone face with mortar

C42/260. ISOLATING PAINT: where new stone is laid against a core of brickwork
- treat brick with one coat of bitumen and sand finish.
- Where it is not possible to paint the core, paint the new stone on all faces except the front, keeping the bitumen back from the face.

C42/270. BEDDING AND POINTING; bed new stones not to be grouted up but do not point until the new work has settled in
- place mortar only under the bearing points of the sills and lintels
- tamp and point last 25 mm to match original work

C42/280. PIECE IN stones as described in preparation and grouting clauses above
- no ashlar to be less than 75 mm in depth
- no feather edging will be permitted
- tool the exposed face to match the existing stone
- observe existing joint lines
- properly secure with dowels, joggles, cramps and mortar as agreed with CA

C42/290. PIECING IN REPAIRS to weathering sections are to be cut under existing brickwork or stonework by a minimum of 75 mm to prevent rain penetrating behind repairs.

C42/295. STITCHING:
- Where possible, carefully cut out stone plug and set aside sound top section for re-use
- protect face of stone with latex paint
- drill hole for dowel or pin across fracture and flush out with volatile solvent
- fill hole 2/3 full with epoxy resin
- protect cored recess, and insert threaded stainless steel dowel cut to required length
- point up recess or replace stone plug
- remove protective latex paint.

C42/300. CRAMPS AND DOWELS: all new work, repairs and rebuilt work is to be properly cramped and dowelled together and to existing adjoining fabric, using cramps and dowels as specified in clauses C42/310, 320.

C42/310. CRAMPS:
- Austenitic stainless steel
- bedded in mortar, as Section Z21, depending upon location

C42/310. DOWELS:
- Austenitic stainless steel
- bedded in mortar or epoxy resin as C42/295, depending upon location

C45 REPAIRING PLASTERWORK

To be read with Preliminaries/General conditions.

C45/100. REFER to section M20 for plastering generally

C45/110. HAZARDS:
- The old plaster in the building will have been decorated with lead paints. The contractor must ensure that the works are carried out in accordance with the Approved Code of Practice to the Control of Lead and Works Regulations 1980. The contractor must keep all dust under control and dispose of in sealed bags to Local Authority Requirements.
- There is also a very small risk of anthrax spores being present on the animal hairs used in old plaster. Comply with the precautionary measures included in Guidance Note 23 (HSE 1979), and ensure all persons who might be exposed to the risk are aware of the early recognition of symptoms and prompt treatment.

C45/110. REPAIRING EXISTING PLASTER:
- Remove plaster which is loose, soft, friable, badly cracked or affected by efflorescence. Gently tap all remaining intact surfaces and remove hollow sounding areas of plaster. Remove stained plaster to 300 mm beyond last point of visible staining.
- Cut back to straight horizontal and vertical edges.
- Advise CA if any built-in timbers, structural deficiencies or sources of damp are revealed.
- Thoroughly dry brush the background and edges to remove dust, loose material and efflorescence before applying plaster.

C45/121. REMOVING EXISTING DAMP PLASTER:
- Remove plaster on walls affected by rising damp up to a height of 300 mm above the highest point reached by the damp or 1 m above the dpc, whichever is higher.
- Rake out perished and salt contaminated mortar joints and cut out and renew any heavily salt contaminated bricks or blocks in the background.
- Advise CA if any built-in timbers, structural deficiencies or additional sources of damp are revealed.
- Thoroughly dry brush background to remove dust, loose material and efflorescence.

C45/141. LIME PLASTER REPAIR MIXES: Plaster mix to match existing; typically
- Render Coat: 1:3 lime: sand with hair if appropriate, 8-10 mm thick
- Floating Coat: 1:3 lime: sand with less hair than render coat, 8-10 mm thick
- Setting Coat: 3:2 lime: sand with no hair, 3mm thick

C46 REPAIRING AND RENOVATING METAL

To be read with Preliminaries/General conditions.

C46/130. CAST IRON HOPPER HEADS AND DOWN PIPES
- Label and carefully take down cast iron hopper heads
- Remove all rust and treat with rust inhibitor “Jenolite” by Jenolite Ltd.
  Rusham Road, Egham, Surrey TW20 9SL
- Label and carefully take down cast iron rainwater pipes
- Box-up securely and store where directed in the premises.

C46/170. CLEANING METAL SURFACES:
- CAST IRON AND STEEL:
  - Carry out a test clean of a small area to be approved by CA before commencing the work.
  - Manual cleaning : chip, scrape grind or wire brush to remove all corrosion and rub down with abrasive paper.
  - Use wet abrasive methods where lead based paint is to be removed; use a rust inhibitor in the final wash; blow water off horizontal surfaces, and out of water traps.
  - Dispose of sludge to the satisfaction of the Local Authority
  - Remove a 25 mm area of paint around chips, scratches and other small defects to ensure that all rust is removed.
  - Blast cleaning ; use metallic abrasive to BS 7079 Part A1:1989 to achieve a finish to meet the paint manufacturer’s requirements. Do not sand blast
  - Feather edge the sound paint immediately prior to application of a rust inhibiting primer
- NON FERROUS METALS:
  - Scrape or wire brush to remove all loose and defective material and rub down with abrasive paper.

C50 REPAIRING TIMBER

C50/100. Read in conjunction with Sections C52 Fungus/Beetle Eradication, G20 Carpentry, Timber Framing etc.
C50/115. TIMBER REPAIRS:
- The minimum amount of historic timber must be cut away in making repairs
- Generally follow the guidance in the SPAB publication “The Repair of Timber Frames and Roofs” Technical Pamphlet 12 for the repair of structural timbers, obtainable from Society for the Protection of Ancient Buildings
  37 Spital Square
  London E1 6DY  Tel: 0171 377 1644
- Repair methods to principal structural timbers to be agreed with CA before commencing any cutting away of timber.
- Epoxy resin is not to be used in timber repairs except with the written agreement of CA

C50/120. TIMBER REPAIRS:
- Generally concealed timbers, including lintels, bressummers and bonding timbers are to be checked for rot and removed if the case. Provide temporary propping to the underside of the brickwork as required and with SE approval.

C51 CLEANING AND REPAIRING JOINERY

C51/100. WINDOW REPAIRS GENERALLY:
- Local repairs are to be carried out retaining the maximum amount of original timber
- Frames are not be removed
- Manufacturer&Reference for the temporary security protection boarding to the windows is:
  "Optiguard plus": A.B.Security Ltd
  Albany Lodge, High Street, Dedham, Colchester, Essex CO7 6HJ
  Tel: 01206 322599 Mobile: 07 770931314 Fax no: 01206323556
  http://www.absecurity.co.uk/Bradbury_Collection/bradbury_collection.html

C51/101. TIMBER WINDOW:
- Remove temporary panel and/or grill, if any. Care to be taken so as not damage frame members and/or stone/brick work.
- Remove putty/glazing and paintwork to reveal condition of frame below. If it is possible, original paint-work colour to be established during the strip back of the paint layers for recording.
- Overhaul all reparable windows. Cut out all rotten timber sections, treat exposed ends with approved timber preservative and replace decayed or missing timber sections with new pre-treated sections of exactly the same section and profiles as the ones which they replace. Existing window patterns are to be re-established. Minor areas of rot can be treated with an approved resin hardeners repair kit.
- Apply two coats of preservative treatment to frame/louvers, 1 suitable oil based primer coat to frame, including rebates. Manufacture and reference: suitable approved proprietary product.
- Re-point externally: neatly mastic point the frame and wall junction (See Z21 MORTARS)
- Supply and fix composite security panel to the exterior frame side.

C51/102. WROUGHT IRON WINDOW:
- Remove temporary panel and/or grill, if any. Care to be taken so as not damage frame members and/or stone/brick work.
- Remove putty/glazing and paintwork to reveal condition of frame below. Care to be taken removing paintwork off wrought iron windows so as not damage frame members (no mechanical grinding will be permitted). Original paint-work colour to be established during the strip back of the paint layers for recording.
- Clean back to rust free metal and have 1 coat of approved metal primer applied. Any residual rust to be treated with an approved rust converter prior to application of primers. Manufacture and reference: suitable approved proprietary product.
- Apply two coats of preservative treatment to frame/louvers, 1 suitable oil based primer coat to frame, including rebates. Manufacture and reference: suitable approved proprietary product.
- Re-point externally: neatly mastic point the frame and wall junction. (See Z21 MORTARS)
- Supply and fix composite security panel to the exterior frame side. The exact methodology will be determinate in site when the external scaffolding is mounted. The composite security panel have to be approved by CA before commencing the work.

C51/103. DOOR REPAIRS GENERALLY:
- For DG01 and DG29 (round head window). Repair and fix composite security panel to the exterior frame side.
- For DG54, DG55, DG56, DG32, DG12 and DG14, remove the lining, architraves, doors and associated ironmongery and store where directed: block the opening with concrete blocks, inserting in the new blockwalls no2-3 perforated blocks for ventilation (for DG12, no15 perforated blocks)

C52 FUNGUS/BEETLE ERADICATION

Fungus-beetle eradication is not directed in the Schedules of Work – the specification clauses at points C52/100-105-121 and 141 are only if fungus-beetle eradication is needed as work proceeds. Agree with CA, QS, PM and Timber Specialist the nature and amount of additional work to be carried out.

To be read with Timber Specialist Specification, Trace, November 2006 and Preliminaries/General conditions.

C52/100. HEALTH AND SAFETY:
- Preservatives to be approved and registered by the Health and Safety Executive (HSE) and listed in ‘The Pesticides Register’ or ‘Reference Book 500’ current at the time of tendering.
- Ensure that the pesticides to be used do not include Lindane

C52/105. HEALTH AND SAFETY: Ensure that the works are carried out by a timber treatment specialist experienced in dealing with historic buildings.

C52/120 ASSOCIATED WORK: Replacement of timber, including its treatment, and other builder’s work are to be carried out by the Main Contractor.

C52/130 ADDITIONAL WORK: As work proceeds, agree with CA the nature and amount of additional work to be carried out.

C52/140 OPENING UP/CUTTING OUT: Take care to minimise damage to sound building fabric and ensure adequate propping and shoring.

C52/150 DRYING OUT: Ensure that effective measures to ventilate and dry out damp building fabric are commenced as soon as possible. Agree methods with CA.

C52/211. DRY ROT:
- Do not disturb fruiting bodies. Spray with fungicide and after inspection by CA remove carefully and clean down.
- Cut out or strip off and remove all infected timber, plaster and other finishes to at least 300-450 mm beyond the furthest extent of attack, having first checked with the CA that this will not adversely affect the building fabric.
- Remove infected materials immediately in bags or as necessary to ensure that no other parts of the building become contaminated. Dispose of materials safely at a tip approved by a Waste Regulation Authority unless otherwise agreed.

C52/220 WET ROT: Cut out all rotten material until sound timber is reached, having first checked with the CA and CC that this will not adversely affect the building fabric.

C52/230 INSECT INFESTATION:
- Probe timber, drilling if necessary, to determine extent of damage.
- Remove timber agreed with CA as being structurally unsound.
- Scrape and trim back all friable parts of otherwise sound timber.
- Remove infected material immediately from the building and dispose of safely at a tip approved by a Waste Regulation Authority.

C52/250 CLEANING: Thoroughly clean down all surfaces in affected areas. Remove all loose material, dust and debris and remove from site without delay.

C52/320 BRUSH/SPRAY APPLICATION:
- Manufacturer and reference: suitable approved proprietary product
- Apply preservative carefully to all surfaces requiring treatment to ensure adequate absorption, using a coarse, low pressure spray.
- Allow each coat to soak in but not to dry before applying further coats.
- Continue applying until the minimum average coverage of the preservative solution recommended by the manufacturer has been achieved.

C52/330 PASTE APPLICATION:
- Manufacturer and reference: suitable approved proprietary product
- Apply to the surface of timber using methods and quantities recommended by the manufacturer and as directed, ensuring full coverage.

C52/340 INJECTION OF INSECT FLIGHT HOLES: In addition to brushing/spraying surfaces, fill insect flight holes with preservative, repeating the operation until lack of absorption indicates saturation of timber.

C52/350 INJECTION OF TIMBER:
- Manufacturer and reference: suitable approved proprietary product
- Insert non-return valves at centres and depths necessary to effectively target areas to be treated.
- Inject preservatives using carefully controlled pressures and quantities recommended by the manufacturer to achieve adequate penetration and saturation of the timber. Avoid excessive leakage of preservative through cracks, flight holes etc.
- Valves to remain in position after treatment unless agreed otherwise with CA.

C52/360 INJECTION OF MASONRY TO PROTECT EMBEDDED TIMBER:
- Manufacturer and reference: suitable approved proprietary product
- Drill holes into wall at centres and to depths necessary to form an effective barrier of fungicide around timber.
- Inject fungicide using carefully controlled methods and quantities recommended by the manufacturer to achieve effective penetration and distribution within the wall.
C52/390 GUARANTEE: Provide an insurance backed guarantee, administered by an independent insurance protection company, for a period of not less than 20 years from Practical Completion

MASONYRY

F10 BRICK AND BLOCK WALLING

To be read with Preliminaries/General conditions.
See also Section C40 CLEANING AND REPAIRING BRICKWORK

TYPE(S) OF WALLING

F10/111. CLAY FACING BRICKWORK: for new external work and brickwork repairs.
- Bricks: To BS 3921 except for sizes and tolerances
  Manufacturer and reference: Chelwood Bricks
  Adswood Road
  Cheadle Hulme
  Cheadle
  Cheshire SK8 5QY
  Special shapes: as required
  - Mortar: As section Z21.
  - Mix: to match existing
  - Special colour: to match existing
  - Bond: to match existing
  - Joints: to match existing
  - Features: imperial sizes to match existing bricks

F10/231. SECOND HAND FACING BRICKWORK for new external work and brickwork repairs an alternative to
- Bricks: Second hand bricks free from deleterious matter such as mortar, plaster, paint, bituminous materials and organic growths. Bricks to be sound, clean and reasonably free from cracks and chipped arrisses.
  Supplier/source: provide samples from available sources.
  - Mortar: As section Z21.
  - Mix: to match existing
  - Special colour: to match existing
  - Bond: to match existing
  - Joints: to match existing
  Features: imperial sizes to match existing bricks

F10/311. CLAY COMMON BRICKWORK:
  No flettons are to be used in any situation.

F10/395. GAUGED BRICK ARCH SETS: to be supplied by a specialist to match the existing as closely as possible

WORKMANSHIP GENERALLY

F10/410 RELATED WORK is specified in the following sections:
F30 Accessories/Sundry items for brick/block/stone walling.
F31 Precast concrete sills/lintels/copings/features.

F10/420 SITE STORAGE: Store bricks/blocks in stable stacks clear of the ground and clearly identified by type, strength, grade, etc. Protect from adverse weather and keep clean and dry.

F10/430 CONDITIONING OF BRICKS:
- Do not use clay bricks or calcium silicate bricks when still warm from the manufacturing process.
- In dry warm weather wet the surfaces of very absorbent bricks slightly to reduce suction. Do not soak.

F10/500 LAYING GENERALLY:
- Lay bricks/blocks on a full bed of mortar; do not furrow. Fill all cross joints and collar joints; do not tip and tail.
- Build walls in stretching half lap bond when not specified otherwise.
- Plumb perpends of facework every third or fifth cross joint along a course and even out the joint widths in between.

F10/535 HEIGHT OF LIFTS:
- Rack back when raising quoins and other advance work.
- Do not use toothing.
- Raise no portion of the work more than 1.2 m above another at any time.
- In facework, complete each lift in one period of operation.
- Do not carry up any one leaf more than 1.5 m in one day unless permitted by the CA.

F10/536 HEIGHT OF LIFTS, LIME MORTAR:
- Allow for the longer set time of lime mortar in determining the maximum height of each lift.

F10/561 COURSING: Arrange brick courses to line up with existing work.

F10/610 SUPPORT OF EXISTING BRICK WORK: Where new lintels or walling are to support existing structure, completely fill top joint with semidry mortar, hard packed and well rammed to ensure full load transfer after removal of temporary supports.

F10/635 JOINTING: When not specified otherwise, finish joints neatly to the specified profile(s) as the work proceeds.

F10/645 UNEXPOSED JOINTS: As the work proceeds, strike off joints that will not be exposed to view in the finished work.

F10/665 POINTING: Where specified, rake out joints to a depth of 12-15 mm as the work proceeds. Subsequently, remove loose debris from the joints using a dry brush, dampen the work, and neatly point to the specified profile in a continuous operation from the top of the wall downwards as the scaffolding is taken down.

F10/670 FIRE STOPPING: Fill joints around joist ends built into cavity walls with mortar to seal cavities from interior of building.

F10/671 FIRE STOPPING: Ensure a tight fit between brickwork and cavity barriers to prevent fire and smoke penetration.

F10/680 HOLES, RECESSES AND CHASES IN BRICK/BLOCK WALLING: Comply with the relevant clause in section P31.

F10/690 ADVERSE WEATHER:
- Do not use frozen materials.
- Do not lay bricks/blocks when the air temperature is at or below 3 degC unless mortar has a minimum temperature of 4 degC when laid and walling is protected. Do not lay mortar on frozen surfaces.
- Maintain temperature of the work above freezing until mortar has fully hardened.
- Rake out and replace mortar damaged by frost. When instructed, rebuild damaged work.
- Protect newly erected walling against rain and snow by covering when precipitation occurs, and at all times when the work is not proceeding.

**ADDITIONAL REQUIREMENTS FOR FACEWORK**

**F10/710**

THE TERM FACEWORK, where used in this specification, applies to all brick/block walls finished fair.

**F10/750**

**COLOUR MIXING:**
- Agree with manufacturer and CA methods for ensuring that the supply of facing bricks is of a consistent, even colour range, batch to batch and within batches.
- Check each delivery for consistency of appearance with previous deliveries and with approved samples or reference panels; do not use if variation is excessive.
- Mix units from different packs and deliveries which vary in colour to avoid patches, horizontal stripes and racking back marks in the finished work.

**F10/760**

**APPEARANCE:**
- Select bricks with unshaped arrisses. Cut with a masonry saw where cut edges will be exposed to view.
- Set out and lay bricks to match appearance of relevant approved reference panel(s).
- Keep courses evenly spaced using gauge rods. Set out carefully to ensure satisfactory junctions and joints with adjoining or built-in elements and components.
- Protect facework against damage and disfigurement during the course of the works, particularly arrisses of openings and corners.

**F10/780**

GROUND LEVEL: Facework to start not less than 150 mm below finished level of external paving or soil except where shown otherwise.

**F10/790**

PUTLOG SCAFFOLDING to facework will not be permitted.

**F10/800**

TOOTHED BOND: Except where a straight vertical joint is specified, new and existing facework in the same plane to be bonded together at every course to give a continuous appearance.

**F10/820**

BRICK SILLS/CAPPINGS: Bed solidly in mortar with vertical joints completely filled. Press mortar firmly into exposed joints and finish neatly.

**F10/830**

CLEANLINESS: Keep facework clean during construction and thereafter until Practical Completion. Turn back scaffold boards at night and during heavy rain. If, despite precautions, mortar marks are deposited on the face of masonry units, leave to dry then remove with a stiff brush. Rubbing to remove marks or stains will not be permitted.

**F10/860**

CRACKED BRICKS in existing facework to be cut out and replaced with matching bricks as clause C40/210. Only where directed.

**F10/870**

POINTING: See clauses C40/240 Keyed Pointing
C40/245 Fine Pointing
F21 NATURAL STONE, ASHLAR WALLING AND DRESSINGS

To be read with Preliminaries/General conditions.

TYPE(S) OF WALLING/DRESSINGS

F21/110 ASHLAR, dressings quoins and the like
- Reference(s): as shown on project drawings, and Schedules of Works.
- Stone is to be free from vents, cracks, fissures, discolouration, or other defects which may adversely affect strength, durability or appearance. Thoroughly seasoned, dressed and worked before delivery to site in accordance with shop drawings prepared by the supplier.
- Finish: to match approved sample.
- Mortar: As section Z21.
- Sand: Graded crushed stone, colour matched to approval.
- Mix: as Particular Specification/Schedule
- Bond: to match existing
- Joints: Flush and to match existing.
- Other requirements: to match original

GENERAL REQUIREMENTS/PRODUCTION

F21/210 RELATED WORK is specified in the following sections:
F10 Brick walling.
F30 Accessories/Sundry items for brick/stone walling.

F21/230 OPERATIVES: Cutting, dressing, laying and jointing of stone to be carried out by skilled masons. Provide evidence of previous experience and details of work previously carried out.

F21/250 PRODUCTION: Stone to be cut and dressed:
- After seasoning but before delivery to site, including shaping, finish(es) and all sinkings for fixing and lifting devices.
- So that exposed and joint surfaces are square, true planes free from hollow or rough areas.
- With minimal deviation from specified dimensions to ensure that specified joint widths are maintained.
- So that natural bed is horizontal in plain walling, vertical and at right angles to wall face in projecting stones and at right angles to line of thrust in arches.

F21/260 IDENTIFICATION: Mark each block/dressing clearly to indicate the natural bed and position in the finished work.

LAYING AND JOINTING

F21/301. REFERENCE PANEL: Prepare a panel, as set out in the Particular Specification/Schedule and obtain approval of appearance before proceeding.

F21/305 PROTECTION:
- Store dressed stone clear of the ground, separate with resilient spacers, protect from inclement weather and keep dry. Prevent soiling, chipping and contamination by salts and other deleterious substances.
- Prevent timber bearers, protective boards, etc. from staining facings in wet conditions by wrapping with polyethylene.
- Prevent damage and disfigurement to stonework during the course of the works. Ensure that arrisses and projecting features are protected using securely fixed slats, boards, etc. Remove at Practical Completion.

F21/315 ADVERSE WEATHER:
- Do not use frozen materials and do not lay on frozen surfaces.
- Do not lay blocks/dressings when air temperature is at or below 3 degC unless mortar has a minimum temperature of 4 degC when laid and walling is protected.
- Maintain temperature of the work above freezing until mortar has fully set.
- Adequately protect newly erected walling against rain and snow by covering when precipitation occurs and at the completion of each days work.
- Rake out and replace mortar damaged by frost and where instructed, rebuild damaged work.

F21/325 LAYING:
- Dampen stones and lay on a full even bed of mortar with all joints filled. Use temporary lead or stainless steel distance pieces to ensure consistent joint width; remove when mortar is sufficiently strong.
- Keep courses level and in line, and accurately plumb all wall faces, angles and features. Set out carefully to ensure satisfactory junctions and joints with adjoining or built-in elements and components.
- Keep stonework clean during construction and until Practical Completion. Ensure that no mortar encroaches on face when laying. Turn back scaffolding boards at night and during heavy rain. Rubbing to remove marks or stains will not be permitted.

F21/334 HEIGHT OF LIFTS: Carry up work with no portion more than 1.2 m above another at any time, racking back between levels. Do not carry up work higher than 1.5 m in one day.

F21/340 PUTLOG SCAFFOLDING will not be permitted.

F21/350 ONE PIECE SILLS/THRESHOLDS: Leave bed joints open except under end bearings. On completion point with mortar to match adjacent work.

F21/360 OPENINGS to be formed using rigid templates accurately fabricated to the required size.

F21/370 JOGGLE JOINTS: Fill with 1:3 lime: sand mortar and tamp to expel air.

F21/380 JOINTING: Finish exposed joints neatly as the work proceeds.

F21/390 POINTING: Carefully rake out exposed joints to a depth of -10 mm as work proceeds, then dust, lightly wet and neatly point in a continuous operation working from the top of the wall downwards.

F21/410 SUPPORT OF EXISTING WORK: Where new lintels or walling are to support existing structure, completely fill top joint with semidry mortar, hard packed and well rammed to ensure full load transfer after removal of temporary supports.

F21/420 REPAIRS to damaged components must not be undertaken without approval. Such approval will not be given where components are badly damaged or where the proposed repair will impair appearance or performance.
F30 ACCESSORIES AND SUNDRY ITEMS FOR BRICK, BLOCK AND STONE WALLING

To be read with Preliminaries/General conditions.

F30/160 AIR BRICKS: where directed.
- To BS 493, Class 1, built in as the work proceeds.
  Manufacturer and reference:
  Design: to match existing
  Work size(s): as required
  Material/colour: terracotta, colour to match surrounding brickwork, or cast iron.

F30/221. WALL TIES FOR tying brick skins together
  Manufacturer and reference: to structural engineer’s specification
  Material/finish: Austenitic stainless steel, minimum 18/8 composition and excluding free machining specifications.

F30/222. WALL TIES FOR improving bond
  Manufacturer and reference: to structural engineer’s specification
  Material/finish: Austenitic stainless steel, minimum 18/8 composition and excluding free machining specifications

F30/270 JOINT REINFORCEMENT FOR STITCHING ETC.
- Manufacturer and reference: to structural engineer’s specification
  Material: Austenitic stainless steel, minimum 18/8 composition and excluding free machining specifications
  Width: Approximately 40-50 mm less in width than wall or leaf.
  - Lay on an even bed of mortar in a continuous strip with 225 mm laps at joints and full laps at angles. Keep back 20 mm from face of external work, 12 mm back from face of internal work and finish mortar joint to normal thickness.

F30/330 DAMP PROOF COURSE:
  Bitumen based to BS 6398 class E
  Manufacturer and reference: Ledkore
  Callenders Construction Products
  Harvey Road
  Burnt Mills Industrial Estate
  Basildon, Essex SS13 1EJ

INSTALLATION OF DPCs/CAVITY TRAYS

F30/400 COLD WEATHER WORKING: In cold weather warm dpc rolls before unrolling, to avoid cracking.

F30/415 HORIZONTAL DPCS:
- Lay in continuous lengths on a full even bed of fresh mortar, with 100 mm laps at joints and full laps at angles.
- Width of dpc to be at least full width of masonry leaf unless otherwise specified. Do not cover edges of dpc with mortar.
- Where there are separate dpcs in each leaf of a cavity wall, ensure that edges do not project into the cavity.
- Immediately lay at least one further course of masonry on a thin even bed of fresh mortar. Keep finished joint thickness as close to normal as practicable.

F30/425 GROUND LEVEL DPCS: Ensure continuity of dpc with damp proof membrane.
F30/435 STEPPED DPCS: Where dpcs are installed in external walls on sloping ground, ensure that they are never less than 150 mm above finished ground level.

F30/445 SILL DPCS to be in one piece and turned up at the back if the sill is in contact with any part of the inner leaf.

F30/455 COPING/CAPPING DPCS:
- Bed dpcs and copings/cappings in one operation to ensure maximum bond between masonry units, mortar and dpc.
- Provide rigid support for dpcs in cavity walls.

F30/535 FACEWORK: Leading edge of dpcs/cavity trays to project 3 mm from face of wall

F30/560 VERTICAL DPCS to be in one piece wherever possible; otherwise overlap by not less than 100 mm with upper piece outermost.

F30/580 JAMB DPCS: Fix to back of timber frames which are to be built in, using galvanized clout nails or staples.

F30/611 MOVEMENT JOINTS: agree methods positions and procedures for providing movement joints with CA and CC before commencing any work.

F30/650 POINTING IN FLASHINGS: Remove dust, lightly wet and neatly point with mortar specified for walling. Ensure joint is completely filled and finish flush.

F30/660 PINNING UP TO SOFFITS: Completely fill joint at top of loadbearing walls with mortar, well rammed into position using temporary shuttering.

F30/670 TOPS OF NON-LOADBEARING WALLS:
- to be restrained as Particular Specification/Schedule
- Securely fix restraints to soffit and completely fill space between wall and soffit leaving no gaps to ensure compliance with design requirements.
STRUCTURAL FRAMING

G12 ISOLATED STRUCTURAL METAL MEMBERS

To be read with Preliminaries/General conditions.

G12/110 FABRICATION OF MEMBERS:
- Do not use sections which are heavily pitted or rusted.
- Make cuts and holes neatly and accurately. Remove burrs, sharp edges and dross caused by flame cutting.

G12/150 SHOP PRIMING FOR ISOLATED STEEL MEMBERS
- Cleaning: Chip, scrape, disc sand and grind surfaces to remove all fins, burrs, sharp edges, weld spatter, loose rust and loose scale. Clean out all crevices. Thoroughly degrease using emulsion cleaners followed by thorough rinsing with water. Apply primer when surface is dry and on the same day as cleaning.
- Primer: One full coat of zinc phosphate modified alkyd brush applied to all surfaces, free from runs and sags.

G12/311 INSTALLATION:
- Position members accurately, using steel packs of adequate area as necessary to achieve a true line and level.
- Fix securely using washers under bolt heads and nuts.
- Use suitably tapered, correctly aligned washers under bolt heads and nuts which bear on sloping surfaces.
- Bolts: to structural engineer’s specification
- Keep within accumulative tolerances of BS5606 Tables 2 & 3

G20 CARPENTRY/TIMBER FRAMING/ FIRST FIXING

To be read with Preliminaries/General conditions.

TYPE(S) OF TIMBER

G20/150 STRESS GRADING OF TIMBER:
- To be carried out by companies currently registered under a third party quality assurance scheme operated by any of the certification bodies approved by the UK Timber Grading Committee.
- Timber of a basic thickness less than 100 mm and not specified for wet exposure to be stress graded at an average moisture content not exceeding 20% with no reading being in excess of 24% and clearly marked as ‘DRY’ or ‘KD’ (kiln dried).
- Timber graded undried (green) and specified for wet exposure conditions to be clearly marked as ‘WET’ or GRN’.
- Structural timber members cut from large graded section to be regraded to approval and marked accordingly.

G20/210 GRADED SOFTWOOD FOR STRUCTURAL MEMBERS
- Stress graded to BS 4978 or other national equivalent and so marked.
- Strength class to BS 5268:Part 2: SC3 -SC7
- Surface finish: as included in the Particular Specification/Schedule
- Preservative treatment: As section Z12 and British Wood Preserving and Damp-proofing Association Commodity Specification C.
- Type/desired service life: to structural engineer’s specification
- Moisture content at time of erection: As clause 450.
G20/270 UNGRADED SOFTWOOD
- Free from decay, insect attack (except pinhole borers) and with no knots wider than half the width of the section.
- Surface finish: as included in Particular Specification/Schedule
- Preservative treatment: As section Z12 and British Wood Preserving and Damp-proofing Association Commodity Specification C
  Type/desired service life: 60 years
- Moisture content at time of erection: As clause 450.

G20/275 WROT TIMBER
- Quality of timber and fixing: To BS 1186:Part 3.
  Moisture content at time of fixing: 13 to 19%.
- Preserving treatment: As section Z12 and British Wood Preserving and Damp-proofing Association Commodity Specification C5.
  Type/desired service life: 60 years
- Method of fixing to each support:
- Other requirements: as included in Particular Specification/Schedule

G20/277 HARDWOODS:
- Do not use hardwoods from tropical rainforests
- Supply supporting documentation to indicate that each batch of hardwood comes from a renewable source managed in accordance with Forest Stewardship Council (FSC) standards or equivalent.
UK contact address: FSC, Mrs Anna Jenkins,
Unit D, Old Station Building, Llanidloes, Powys, Wales
Tel: 01686 413916.

WORKMANSHIP GENERALLY

G20/410 CROSS SECTION DIMENSIONS OF TIMBER shown on drawings are basic sizes unless stated otherwise.
Maximum permitted deviations from basic sizes to be as stated in BS 4471 for softwoods and BS 5450 for hardwoods.

G20/415 REDUCTION TO FINISHED SIZES of planed/regularized timber to be to BS 4471 for softwoods and BS 5450 for hardwoods.

G20/430 SELECTION AND USE OF TIMBER:
- Do not use timber members which are damaged, crushed or split beyond the limits permitted by their grading.
- Ensure that notches and holes are not so positioned in relation to knots or other defects that the strength of members will be reduced.
- Do not use scarf joints, finger joints or splice plates without approval.

G20/440 PROCESSING TREATED TIMBER:
- Carry out as much cutting and machining as possible before treatment.
- Retreat all treated timber which is sawn along the length, ploughed, thicknessed, planed or otherwise extensively processed.
- Treat timber surfaces exposed by minor cutting and drilling with two flood coats of a solution recommended for the purpose by main treatment solution manufacturer.

G20/450 MOISTURE CONTENT of timber at time of erection to be not more than:
Under cover in generally unheated spaces: 24%
Under cover in generally heated spaces: 20%
Internal in continuously heated spaces: 20%
G20/510 PROTECTION:
- Keep timber dry and do not overstress, distort or disfigure sections or components during transit, storage, lifting, erection or fixing.
- Store timber and components under cover, clear of the ground and with good ventilation. Support on regularly spaced, level bearers on a dry, firm base. Open pile to ensure free movement of air through the stack.
- Arrange sequence of construction and cover timber as necessary during and after erection to ensure that specified moisture content is not exceeded.
- Keep trussed rafters vertical during handling and storage.

G20/520 SEAL exposed end grain of the following with preservative to the recommendations of the timber treatment company before delivery to site:
Preservative treated timbers to Z12

G20/531 PAINTED FINISHES: Structural timber which is to be painted to be primed as specified before delivery to site. CA is to be given due notice for inspection before treatment, and a certificate supplied that the correct grade of primer or sealer has been used. A copy of the certificate is to be forwarded to the PM

G20/540 CLEAR FINISHES: Structural timber which is to be clear finished to be kept clean and first coat of specified finish applied before delivery to site.

G20/550 EXPOSED TIMBER: Prevent damage to and marking of surfaces and arrisses of planed structural timber which will be exposed to view in completed work.

JOINTING TIMBER

G20/570 JOINTING/FIXING GENERALLY: The timber are to be fix in the same manner of the existing. As a general rule, straps or joist hangers do not have to be used because they are not original method of construction. If it is no possible to determine the original method of construction, select fixing and jointing methods and types, sizes and spacings of fastenings in compliance with section Z20. Fastenings to comply with relevant British Standards.

G20/580 FRAMING ANCHORS:
- Manufacturer and reference(s): as included in the Particular Specification/Schedule
- Fix anchors securely using not less than the number of nails recommended by the anchor manufacturer.
- Nails to be not less than 30 x 3.75 mm galvanized or sherardized square twist unless recommended otherwise.

G20/630 BOLTED JOINTS:
- Locate holes accurately and drill to diameters as close as practical to the nominal bolt diameter and not more than 2 mm larger.
- Place washers under all bolt heads and nuts which bear directly on timber. Use spring washers in locations which will be hidden or inaccessible in the completed building.
- Tighten bolts so that washers just bite the surface of the timber and at least one complete thread protrudes from the nut.
- Check at agreed regular intervals up to Practical Completion and tighten as necessary to prevent slackening of joints

ERECTION AND INSTALLATION

G20/770 ADDITIONAL SUPPORTS:
- Where not shown on drawings, position and fix additional studs, noggings or battens for appliances, fixtures, edges of sheets, etc., in accordance with manufacturers’ recommendations.
- All additional studs, noggings or battens to be of adequate size and have the same treatment, if any, as adjacent timber supports.

G20/780 WALL PLATES: Ensure that wall plates are:
- Positioned and aligned to give the correct span and level for trusses, joists, etc.
- Fully bedded in fresh mortar.
- In lengths of not less than 3 m with half lap joints.

G20/784 INSTALLING JOISTS GENERALLY:
- Position at equal centres not exceeding designed spacing and true to level.
- Install bowed joists with positive camber.
- Position end joists approximately 50 mm from masonry walls.

G20/786 INSTALLING JOISTS ON HANGERS:
- Bed hangers directly on and hard against supporting construction. Do not use packs or bed on mortar.
- Cut joists to leave not more than 6 mm gap between ends of joists and back of hanger.
- Rebate joists to lie flush with underside of hangers.
- Fix joists to hangers with a nail in every hole.

G20/791 JOIST HANGERS
- Manufacturer and reference(s): as included in the Particular Specification/Schedule
- Material/finish: galvanised mild steel or stainless steel
- Size: To suit joist, design load and crushing strength of supporting construction.

G20/795 TRIMMING OPENINGS: When not specified otherwise, trimmers and trimming joists to be not less than 25 mm wider than general joists.

G20/821 VERTICAL RESTRAINT STRAPS:
- as included in the Particular Specification/Schedule to comply with the Building Regulations
- Material: stainless steel

G20/831 LATERAL RESTRAINT STRAPS:
- as included in the Particular Specification/Schedule to comply with the Building Regulations
- Material: stainless steel

G20/840 STRUTTING:
- Unless specified otherwise, securely fix strutting between joists as follows:
  - Joist spans of 2.5 to 4.5 m: One row at centre span.
  - Joist spans over 4.5 m: Two rows equally spaced.
- Unless specified otherwise strutting to be one of the following:
  - Herringbone strutting, at least 38 x 38 mm softwood and located clear of top and bottom edges.
  - Solid strutting, at least 38 mm thick softwood and at least three quarters of depth of joist.
  - Outer joists to be blocked solidly to perimeter walls.

G20/950 FASCIAS/BARGES/SOFFITS:
- To match existing.
CLADDING AND COVERING

H62 NATURAL SLATING

To be read with Preliminaries/General conditions.

TYPE(S) OF SLATING

H62/110 ROOF SLATING
details as included in the Particular Specification/Schedule
Pitch: as original
- Slates: To BS 680:Part 2.
Supplier and reference: Blue Grey Welsh slates to match original
Size: to match original
Fixing: As clause 275, minimum end lap as Particular Specification/Schedule

SLATING GENERALLY

H62/210 BASIC WORKMANSHIP: Keep slates clean and dry until laid. Set out to give true lines and regular appearance, fitting neatly at all edges, junctions and features. Fix slate roofing to make the whole sound and weathertight at the earliest opportunity. Repair any defects as quickly as practicable to minimise damage and nuisance. Keep gutters and pipes free of debris and clean out at completion.

H62/220 EXISTING NATURAL SLATING: Carefully remove slates, battens, underlay, etc. the minimum necessary to carry out alterations, ensuring minimum disturbance of adjacent slates.

H62/240 UNDERLAY:
- Handle carefully to prevent tears and punctures and repair with adhesive tape any which do occur.
- Lay parallel to eaves, maintaining consistent tautness to minimise gaps.
- Vertical laps not less than 100 mm wide, coinciding with supports. Horizontal laps of the dimensions specified. Fix with galvanized steel, copper or aluminium extra large head felt nails.
- Where pipes and other components penetrate the underlay, use proprietary underlay seals or cross cut neatly and accurately and turn flanges up to give a tight, watershedding fit.
- Ensure that underlay does not obstruct roof ventilation.

H62/245 BATTENS/COUNTERBATTENS:
- Sawn softwood, species to BS 5534:Part 1, clause 11.3.
Grading: To BS 4978, clause 5 or 9.
Moisture content: not more than 22% at time of fixing.
- Preservative treatment: CCA or OS double vacuum as section Z12 and British Wood Preserving and Damp-proofing Association Commodity Specification C8.
- Fix as specified below.

H62/255 COUNTERBATTENS ON RIGID SARKING:
- Fix at centres coinciding with rafters/trusses marking positions of latter at top edges and eaves before laying underlay.
- Fix through rigid sarking into rafters/trusses at not more than 300 mm centres.
BATTENS ON TIMBER SUPPORTS:
- To be in straight horizontal lines, aligned on adjacent areas, with no batten less than 1200 mm long.
- Joints to be square cut, butted centrally on supports and must not occur more than once in any group of four battens on any one support.
- Provide an additional batten where an unsupported lap in the underlay occurs between battens.
- Fix each batten to each support, splay nailing at ends.

SLATE FIXING:
- Lay with an even overall appearance, with slightly open butt joints and tails of slates aligned.
- Use slates of consistent thickness in any one course laid with thicker end as tail.
- Use extra wide slates at ends of courses to maintain bond and ensure that cut slates are as large as possible. Do not use half slates.
- Centre fix each slate with two copper nails to BS 1202: Part 2, 2.65 x 25 mm long for 19 mm thick battens, 30 mm long for 25 mm thick battens, through countersunk holes 20-25 mm from side edges. Fix slates wider than width and a third with three nails.
- At sprocketed changes of pitch increase length of nails as necessary to ensure full penetration of battens.

MORTAR BEDDING/POINTING:
- Mortar: As section Z21, either 1:4 cement:sand with air entraining agent, or 1:3 masonry cement:sand.
- Do not use in wet or frosty weather or when imminent.
- Concrete and clay tile accessories to be bedded must be wetted and surface water allowed to drain before fixing.
- Finish neatly as work proceeds and remove any residue.

ROOF SLATING EDGES/JUNCTIONS/FEATURES

GENERALLY:
- Form using the specified fittings and accessories; do not improvise without approval.
- Cut slates only where necessary, with an appropriate tool, to give neat, close fitting joints and straight, clean edges.
- Fix edge slates and fittings securely to neat, true lines.
- Ensure that all flashings (specified in another section) are fixed with or immediately after the slating, and are neatly dressed down.

FIRE SEPARATING WALLS:
- Ensure that separating wall is cut on the rake 25 mm to 50 mm below top of adjacent rafters.
- Fill space over top of the wall with layer(s) of mineral fibre quilt so that, when underlay and battens are laid it is lightly compressed. Tuck edges of quilt between edges of wall and adjoining rafters.
- Lay 300 mm wide pads of mineral fibre quilt thick enough to seal all gaps and cut to fit snugly between battens. Fix in position with continuous self-adhesive tape from ridge to eaves before slating.
- At boxed eaves completely seal air paths in the plane of the separating wall with wire reinforced mineral fibre, 50 mm thick, nailed to rafter and carefully cut to shape.
H62/345  EAVES:
- Ensure that top of fascia board is at correct level.
- Continuous eaves ventilator trays to support underlay: or fascia ventilator grilles
  Before fixing, lay pieces of 100 mm mineral fibre quilt between rafters, over and
  behind the wallplate.
- Fix a 325 mm width of BS 747 type 5U felt underlapping first width of underlay
  and dress down into gutter.
- Fix additional batten for under eaves course.
- Fix slates with tails projecting to align with centre of gutter.

H62/445  MORTAR BEDDED VERGE WITH BEDDED UNDERCLOAK:
- Ensure that gable wall is brought up to correct level.
- Bed undercloak of slates sloping away from and projecting 25 mm beyond face
  of wall on mortar identical to that used in gable walling and point neatly.
  Undercloak to be level with underside of slating battens.
- Carry underlay over undercloak and trim off 25 mm short of verge edge.
- Bed edge of verge slates flush with undercloak on 75 mm wide bed of mortar as
  clause 290. Point to a neat, struck weathered profile giving 5 mm overhang of
  verge slates. Ensure mortar is not displaced or cracked by mechanical fixing of
  slates.

H62/455  MORTAR BEDDED VERGE WITH NAILED UNDERCLOAK:
- Ensure that gable wall is brought up to level of underside of slating battens.
- Nail undercloak of slates on top of underlay sloping away from roof and
  projecting beyond face, all to mach existing.
- Bed edge of verge slates flush with undercloak on 75 mm wide bed of mortar as
  clause 290. Point to a neat struck weathered profile giving 5 mm overhang of
  verge slates. Ensure mortar is not displaced or cracked by mechanical fixing of
  slates.

H62/615  LEAD VALLEY:
- Ensure that valley board, plywood valley sheathing and tilting fillets provide full
  support for lead gutter (specified in another section).
- Cut underlay to rake and dress over tilting fillets to lap onto lead gutter. Ensure
  that underlay is not laid under lead.
- Cut extra wide slates neatly to form a gap to match existing width centred on
  gutter.

H62/660  SIDE ABUTMENT:
- Turn underlay at least 100 mm up abutment.
- Cut slates as necessary and interleave with lead soakers (specified in another
  section) to form a close weathertight abutment. Fix soakers by turning down
  over head of each slate.
- Ensure that stepped lead apron flashing (specified in another section) is
  dressed closely over soakers with a lap of at least 50 mm.

H62/670  TOP EDGE ABUTMENT:
- Turn underlay at least 100 mm up abutment.
- Finish slating with head-nailed short course.
- Ensure that lead flashing (specified in another section) is dressed down close to
  slates to retain the top course against wind uplift.
H71 LEAD SHEET COVERINGS AND FLASHINGS

To be read with Preliminaries/General conditions.

TYPE(S) OF LEADWORK

H71/110 LEAD ROOFING
- As included in Particular Specification/Schedule
- Preparation included in this section: make good as clause 620
- Type of lead: milled or machine cast as clause 550, code 7
- Other requirements: use existing lead re-cast where possible

H71/210 LEAD GUTTER LINING: lead to be code 5

H71/211 LEAD GUTTER LINING WITH EXPANSION JOINTS:
- As included in Particular Specification/Schedule
- Type of lead: milled or machine cast as clause 550, code 5
- Cross joints: Neoprene/terne coated stainless steel expansion joints:
  T-Pren, as supplied by: British Lead Mills,
  Peartree Lane, Welwyn Garden City, Herts AL7 3UB
  Weld expansion joints to lead gutter linings in accordance with joint
  manufacturer's recommendations.

H71/220 PITCHED LEAD VALLEY GUTTER LINING: to be lead code 6

H71/310 APRON FLASHINGS
- Lead: Code 4 in lengths not exceeding 2250 mm.
- End to end joints: Laps of not less than 100 mm.
- Dimensions:
  Upstand: Not less than 75 mm.
  Cover to abutment: as recommended for roof pitch.
- Fixing: as Particular Specification/Schedule

H71/322 COVER FLASHINGS
- Drawing reference(s): as included in project drawings or Particular
  Specification/Schedule
- including cover flashings to blocking courses and cornices
- Lead: Code 6 in lengths not exceeding 2250 mm.
- End to end joints: Laps of not less than 100 mm.
- Cover: Overlap to upstand of not less than 75 mm.
- Fixing: as Particular Specification/Schedule

H71/329 SOAKERS AND STEP FLASHINGS
- Drawing reference(s): as Particular Specification/Schedule
- Soakers:
  Lead: Code 4 cut and dressed to shape for fixing by roofer.
  Dimensions:
  Length: Slate/tile gauge + lap + 25 mm.
  Upstand: Not less than 75 mm.
  Underlap: Not less than 100 mm.
- Step flashings:
  Lead: Code 5 in lengths not exceeding 2000 mm.
  End to end joints: Laps of not less than 100 mm.
  Cover: Overlap to soaker upstands of not less than 65 mm.
  Fixing: Lead wedges at every course.
H71/343  SINGLE STEP FLASHINGS for lead pitched roofs
- Drawing reference(s): as Particular Specification/Schedule
- Lead: Code 4 in lengths not exceeding 2000 mm.
- End to end joints: Laps of not less than 50 mm.
- Cover: Overlap to lead roof upstand of not less than 65 mm.
- Fixing: Lead wedges at every step.

H71/362.  CHIMNEY FLASHINGS:
- Drawing reference(s): as Particular Specification/Schedule
- Front apron: Lead: Code 4
  Length: Width of chimney plus not less than 150 mm underlap to each side flashing. Upstand: Not less than 75 mm. Cover to roof: to suit the pitch. Fixing: Lead wedges into bed joint.
- Soakers:
  Lead: Code 4 cut and dressed to shape for fixing by roofer.
  Dimensions: Length: Slate/tile gauge + lap + 25 mm.
  Upstand: Not less than 75 mm. Underlap: Not less than 100 mm.
- Step flashings: Lead: Code 5 in lengths not exceeding 1500 mm.
  End to end joints: Laps of not less than 100 mm. Front end: Turn 75 mm around chimney over apron. Cover: Overlap to soaker upstands of not less than 65 mm. Fixing: Lead wedges at every course.
- Back gutter: Lead: Code 4
  Length: Width of chimney plus not less than 100 mm overlap to each side flashing. Upstand: Not less than 100 mm. Gutter sole: Not less than 150 mm. Cover up roof not less than 225 mm.
- Back gutter cover flashing: Lead: Code 4
  Length: Width of chimney plus not less than 100 mm overlap to each side flashing. Cover: Overlap to back gutter upstand of not less than 75 mm.

H71/370  LEAD SLATES:
- Lead: Code 4 cut and dressed to shape for fixing by roofer.
- Dimensions:
  Base: Not less than 400 x 400 mm
  Upstand: Not less than 150 mm, to fit pipe and at angle to suit roof pitch.

H71/410  RIDGE/HIP ROLLS TO LEAD ROOFS:
- Drawing reference(s): as Particular Specification/Schedule
- Core: Rounded timber as clause 650.
- Size: as Particular Specification/Schedule. Fix to ridge/hip board with brass or stainless steel screws at not more than 600 mm centres.
- Capping: Lead of the same code as the roof, in lengths. Intersections with rolls in the roofing to be leadwelded off site and bossed to fit
  Laps: Not less than 150 mm for ridges, 100 mm for hips.
  Cover: as Particular Specification/Schedule. Wings of capping to extend not less than 75 mm on to roof.
- Fixing: Nail each sheet at underlapping end and secure wings with one copper or stainless steel clip as clause 720 per roofing bay and at each lap.

H71/411.  RIDGE/HIP ROLLS TO SLATE ROOFS:
- Drawing reference(s): as Particular Specification/Schedule
- Core: Rounded timber as clause 650.
- Size: as Particular Specification/Schedule. Fix to ridge/hip board with brass or stainless steel screws at not more than 600 mm centres.
- Capping: Lead of code 5, in lengths not exceeding 2000 mm. for ridges, 1500 mm for hips.
  Laps: Not less than 150 mm for ridges and hips.
  Cover: Wings of capping to extend not less than 150 mm on to roof.
- Fixing: Nail each sheet at underlapping end and secure wings with one copper or stainless steel clip as clause 720 at each lap and as recommended by the Lead Sheet Association.
GENERAL REQUIREMENTS/PREPARATORY WORK

H71/510 WORKMANSHIP GENERALLY:
- Cut, joint and dress lead neatly and accurately, to provide fully waterproof coverings/flashings, free from ripples, kinks, buckling and cracks.
- Comply with BS 6915 and current good practice as described in the latest editions of 'The Lead Sheet Manual' published by the Lead Sheet Association, unless specified or agreed otherwise.
- Do not use scribers or other sharp instruments to mark out lead.
- Use solder only where specified.
- Ensure that finished leadwork is fully supported, adequately fixed to resist wind uplift but also able to accommodate thermal movement without distortion or stress.

H71/512 AVOIDANCE OF LEAD CORROSION
- Increase the level of ventilation to the underside of the lead when renewing lead roofs, in accordance with the recommendations in Volume 3 of the Lead Sheet Manual. Check and follow the latest guidance of the Lead Sheet Association and English Heritage.

H71/517 IN SITU LEADWELDING: is only permitted in exceptional circumstances, subject to completion of a 'hot work permit' form and compliance with its requirements.

H71/550 LEAD SHEET: Colour marked for thickness and weight and of the type and code specified:
- Milled, to BS 1178, or
- Machine cast, to BS 1178 in respect of general quality, chemical composition and tolerance on thickness, or
- Sand cast, from lead complying with BS 1178 and free from bitumen, solder, other impurities, inclusions, laminations, cracks, air, pinholes and blowholes. Thickness(es) as BS 1178 but with a tolerance of B10%.

H71/555 UNDERLAY
- To plywood, and similar smooth even substrates: Waterproof building paper to BS 1521 Class A
- Generally: Proprietary Geotextile underlay, weight 210gm/m² (± 5%) or greater,

H71/572 EXISTING LEAD TO BE REMOVED will remain the property of the Employer. Give ample notice to the CA of when the lead is to be stripped, so that arrangements can be made for supervision. Using a certified weighing machine, record the weight of all stripped lead and give copies of certificates to the CA. Store in an approved place.

H71/580 REPLACEMENT OF EXISTING LEAD must be carried out in small sections at a time to reduce the risk of weather damage to a minimum. Provide and maintain temporary waterproof coverings to ensure that there is no damage to the existing base and building.

H71/610 SUITABILITY OF BASES:
- Bases to be dry and free of dust, debris, grease and other deleterious matter.
- Laying of lead will be taken as joint acceptance by the Main Contractor and Subcontractor of the suitability of bases.

H71/620 PREPARATION OF EXISTING TIMBER BASES: Inform CA of any defective boards and comply with instructions for replacement. Ensure that all boards are
securely fixed. Punch in any protruding fastenings and plane or sand as necessary to achieve an even surface.

H71/650  TIMBER FOR USE WITH LEADWORK:
- Planed, free from wane, pitch pockets, decay and insect attack except pinhole borers.
- Moisture content: Not more than 22% at time of covering.
- Type: white softwood. Do not use timbers which give off acid vapours such as oak, sweet chestnut, as listed in the publications ‘Corrosion of metals by wood’ by DoI 1979, and BRE 1985 and similar woods.

H71/665  CHALK PATINATION OF NEW LEAD
- Check latest guidance from the Lead Sheet Association and English Heritage before specifying this method of treatment.
- An assessment of the risk of underside corrosion of the lead must be carried out and submitted with a method statement to the Conservation Consultant before starting this work.
- Chalk: Needham Chalks Limited
  Needham Market
  Ipswich IP6 8EL
  Tel: 01449 720227
- Prepare substrate and lead in accordance with clauses 670, 680 and 690 as specified before laying the new lead.

H71/670  PRETREATMENT OF THE LEAD
- Remove any deposits from the lead sheets with a nylon scourer, to expose a bright and shiny surface.
- Prepare a slurry of chalk powder in three times its volume of water. Stir regularly during application to ensure that the chalk remains in suspension.
- Using a paintbrush or spray, apply a uniform coating of the slurry to the undersides of the lead sheets
- Leave this for at least two hours, and preferably overnight. Then brush off any remaining chalk.

H71/680  INSITU TREATMENT
- Prepare a paste of chalk powder in twice its volume of water, to give a consistency similar to that of emulsion paint
- After bossing each lead sheet into shape, turn it over and paint on the paste to a sufficient thickness and uniformity
- In order to avoid possible capillary action of rainwater, do not apply chalk to the bottom 50 mm of a lap, the flat part of a splashlap, or the bottom 15 mm of the adjacent step or roll. Wipe off any chalk inadvertently applied to these areas.
- If required, the chalk may also be applied to the substrate of the underlay.
- After a few moments, when the chalk is touch-dry, lower the sheet carefully and fix in place.

H71/690  USE OF CHALK COATED UNDERLAYS
- Apply a thin coating of paste directly to the substrate boarding or to a building paper or similar underlay, or
- Use a chalk impregnated geotextile underlay, or
- Apply a 3 mm skim coat of chalk paste to the underlay using plasterer’s tools.

FIXING/JOINTING LEAD

H71/710  HEAD FIXING LEAD SHEET:
- Where not specified otherwise, secure top edge of lead sheets with two rows of fixings, 25 mm and 50 mm from top edge of sheet, at 75 mm centres in each row, evenly spaced and staggered.
Sheets less than 500 mm deep may be secured with one row of fixings, 25 mm from top edge of sheet and evenly spaced at 50 mm centres.

**H71/715 FIXINGS:**
- Where not specified otherwise, fix lead sheet to timber substrates with:
  - Copper clout nails to BS 1202:Part 2, table 2, with annular ring, helical ring or serrated shank, length not less than 20 mm, shank diameter not less than 3.35 mm and head diameter not less than 8 mm, or
  - Stainless steel (austenitic) clout nails with annular ring, helical ring or serrated shank, length not less than 19 mm, shank diameter not less than 2.65 mm and head diameter not less than 8 mm.
- Where not specified otherwise, fix lead sheet to concrete or masonry substrates with:
  - Brass or stainless steel screws to BS 1210, table 3, length not less than 19 mm and diameter not less than 3.35 mm, with washers of the same material and plastics plugs of length and diameter to suit screws.

**H71/720 CLIPS:**
- Generally 50 mm wide where not specified to be continuous, length to suit detail.
- Lead clips to be cut from sheets of same code as sheet being secured.
- Copper clips to be cut from 0.7 mm minimum thick sheet to BS 2870, temper grade 1/4H, dipped in solder if exposed to view.
- Stainless steel clips to be cut from 0.38 mm minimum thick sheet to BS 1449:Part 2, grade 304, terne coated if exposed to view.
- Unless specified otherwise fix each clip with two fastenings not more than 50 mm from edge of lead sheet. Clips welted around edges of sheets to be turned over 25 mm.

**H71/724 CONTINUOUS CLIPS:**
- Width to suit detail.
- Lead continuous clips to be cut from sheet one code more than fixed sheet.
- Copper continuous clips to be cut from 0.7 mm thick sheet to BS 2870.
- Stainless steel continuous clips to be cut from 0.46 mm thick sheet to BS 1449:Part 2, grade 304.
- Fix at specified centres. Welt edge of lead sheet around continuous clip and dress down.

**H71/840 SCREW FIXING INTO JOINTS/CHASES:**
- Carefully rake out joint/chase to a depth of not less than 25 mm.
- Dress lead into joint/chase and up back face. Fix into back face with stainless steel screws and washers and plastics plugs at not more than 450 mm centres, at every change of direction, and with at least two fixings for each piece of lead.
- Introduce building paper between lead and mortar in accordance with Lead Sheet Association recommendations, and point with mortar to match adjacent.

**H71/880 FINISHING:** As soon as practical, apply a smear coating of patination oil, evenly in one direction and in dry conditions, to all leadwork, except faces to be painted.
WATERPROOFING

J21 MASTIC ASPHALT ROOFING/FINISHES

To be read with Preliminaries/General conditions.

TYPE(S) OF MASTIC ASPHALT ROOFING WORK

J21/111. ROOFING: Decks to be designed in accordance with Mastic Asphalt Council and Employers' Federation (MACEF) recommendations and BS 6229;
- adequate ventilation details and movement joints to be provided.
- Drawing reference(s): as included in the project drawings and Particular Specification/Schedule

GENERAL REQUIREMENTS

J21/210 ROOFING GENERALLY:
- Lay roof covering to provide a secure, free draining and completely weathertight roof.
- Ancillary products and accessories, where not specified, to be types recommended for the purpose by the asphalt manufacturer.
- Use operatives certified after four years training in a course recognised by the. Submit evidence of training to CA on request.
- Maintain a minimum of 75 % fully trained operatives on site throughout the installation period.

J21/220 ADVERSE WEATHER:
- Provide temporary covers and drainage as required to keep unfinished areas of the roof dry.
- Protect daywork joints in warm deck roofs with a lapped and fully bonded strip of BS 747, Type 5B felt or equivalent.
- Protect edges of phased roofing with temporary asphalt kerbs, fully sealed to base.
- Suspend work in severe or continuously wet weather unless an effective temporary roof is provided over the working area.
- If unavoidable wetting of the construction does occur, take prompt action to minimise and make good any damage.

J21/225 PROTECTION: Until Practical completion, ensure that:
- The roof is not used as a working platform unless fully protected to the satisfaction of the CA.
- No petroleum based solvents or other chemicals harmful to bitumen are allowed to come into contact with the roof surface.
- No building materials are stored on the roof.
- Finished roof areas are adequately protected from damage by subsequent building operations.

J21/250 PRIMER(S): Type(s) recommended for the purpose by the manufacturer of the material to be bonded. Apply by mopping, brushing or spraying to achieve an even and full cover of the surface. Allow to dry thoroughly before covering.

J21/260 BONDING COMPOUND(S):
- Unless specified otherwise oxidised bitumen to BS 3690: Part 2, grade as recommended by the manufacturer of the material to be bonded for the conditions and type of surface. Heat and lay at a temperature sufficient to ensure bonding over the whole surface. Do not overheat.
- For bonding of and to heat sensitive insulation materials use cold bonding bituminous adhesive recommended by the insulation manufacturer.

**J21/270 USING BOILERS/CAULDRONS ON SITE:**
- The boiler must be either thermostatically controlled or manually controlled using standard calibrated thermometers.
- Submit a 'Hot Work Permit' to the CA prior to commencing work, obtain agreement before proceeding and comply with its requirements.

**BASES**

**J21/300 SUITABILITY OF BASE:** Before laying asphalt ensure that:
- The base is to even falls with no areas which will pond.
- Surfaces to be covered are firmly fixed, clean, dry, smooth, free from frost, contaminants, voids and protrusions.
- All preliminary work including formation of upstands, kerbs, box gutters, sumps, grooves, chases, expansion joints, etc. and fixing of battens, fillets, anchoring plugs/straps, flashings, copings, roof outlets, pipesleeves, ventilators, etc. is complete and satisfactory.

**J21/310 RENEWING EXISTING ASPHALT:**
- Agree with the CA the extent of the area(s) to be renewed.
- Remove, renew and waterproof each area on the same day, unless agreed otherwise with the CA.
- Adequately protect existing and new area(s) of roof against damage during the execution of the work.
- Where removal results in accidental damage to existing elements which are to remain, agree proposed repair or replacement with the CA.

**J21/330 MAKING GOOD EXISTING ASPHALT:**
- Remove existing chippings or tiles and clear roof of all dust, dirt, debris, moss and grease.
- Remove defective areas of asphalt where instructed. Use hot poultices to soften existing asphalt, cut at a shallow angle at edges and remove with a trowel. Do not use hammers, chisels, etc. to remove asphalt.
- Ensure base is dry and make good separating membrane. Patch repair level with existing surface with two coats of asphalt, the top coat being lapped not less than 75 mm on to existing asphalt and to half its depth.

**J21/340 TIMBER FOR TRIMS, ETC. BY ROOFING SUBCONTRACTOR:**
- Planed, free from wane, pitch pockets, decay and insect attack except pinhole borers.
- Moisture content: Not more than 22% at time of covering.
- Preservative treatment: CCA as section Z12 and British Wood Preserving and Damp-proofing Association Commodity Specification C8.
- Fix with sherardized steel screws at not more than 600 mm centres.

**J21/360 KEYING TO BRICKWORK/ BLOCKWORK:** Raking out joints of backing brickwork does not provide a suitable key for asphalt. Use methods recommended by the mastic asphalt manufacturer.
- Fully seal at penetrations using bonding or taping methods recommended by MACEF
ASPHALT/ACCESSORIES

J21/621 MOVEMENT JOINT SYSTEM: Suitable approved proprietary product.

J21/630 SEPARATING LAYER: Black sheathing felt to BS 747, type 4A. Loose lay with 75 mm laps immediately prior to laying asphalt.

J21/632 SEPARATING LAYER: Manufacturer and reference: Suitable approved proprietary product. Loose lay with end and side laps sealed.

J21/640 APPLICATION OF ASPHALT:
- Ensure thorough mixing when remelting and do not heat to more than 230 degC. Do not use reheated asphalt.
- Apply each coat to even thickness using suitable gauges and float to a smooth surface free from imperfections and crazing. Apply successive coats without delay and within the same working period.
- Ensure complete fusion of asphalt at all joints to give a continuous watertight membrane. Clean and heat the edges of previously laid coats by poulticing with hot asphalt. Remove and discard poultice and cut away edge to remove sand rubbed material before jointing. Lay new asphalt whilst poulticed surface is still hot. Torching will not be permitted.
- Stagger junctions of bays in successive coats by not less than 150 mm.
- Pierce any blows and make good affected areas while asphalt is still at working temperature.
- Form solid fillets in all internal angles, fully fused to asphalt coating and not less than 40 mm wide on face and at an angle of approximately 45 deg to the horizontal.
- Maintain full thickness of asphalt around external angles.
- Turn asphalt into splayed chase at top edge of skirtings and vertical work. Finish top surface with a splay to shed water away from the wall, maintaining full thickness.
- Form watertight joints around pipes, gullies and other penetrations.
- Finish asphalt to a smooth flat surface, free from lipping, pitting, scars and other imperfections. Sand rub all horizontal surfaces while asphalt is still warm, using clean, coarse sand from natural deposits, passing a 600 micron sieve and retained on a 210 micron sieve.

J21/820 COMPLETION: Ensure that:
- Roof areas are left clean with all outlets clear.
- All work by others necessary to provide a weathertight finish is satisfactorily completed.
- Defects are repaired without delay to minimise damage and nuisance.

J22 FELT MEMBRANE

J21/100 Manufacturer and reference: (provisional)
Marley Waterproofing
Covert Road
Aylesham Industrial Estate
Aylesham
Kent CT3 3EQ

Product: Quikflo Standard Underlayer 173716 in accordance with BS EN 12310, 12311, 12730, 1109 & 1928.
J21/101 Relevant method statement to be submitted for review and comments to CA and SE prior to commencement of works.

J21/102 COMPOSITION / INFORMATION ON INGREDIENTS. A solid sheet of material consisting of a reinforced base coated in oxidised or polymer modified bitumen mixed with fillers and then covered in sand and/or mineral granules.

J21/103 HAZARDS The products themselves are not hazardous. However many of the fixing systems involved in installing roofing felts involve either the use of hot bitumen or require bitumen on the felt itself to be melted to provide a bond. There is therefore a risk of thermal burns from the hot bitumen.

J21/104 STORAGE Membranes must be stored on end, on a clean, level surface away from excessive heat and under cover.

J21/105 PREPARATION The surface over which the membranes are to be installed should be clean and dry and the deck must comply with the relevant requirements of BS 6229:2003. If a primer is necessary, this must be allowed to dry completely. Porous or very dusty /friable surfaces may require a second coat of bitumen primer.

J21/106 INSTALLATION Normal good practice must be followed and be generally in accordance with BS 8217. The membrane has to be installed on a plywood substructure (BS EN 636-3)

J21/107 PROTECTION In compliance with good roofing practice, completed work should be protected from damage, particularly if following trades will be working on or over the roof.

J21/108 SITE QUALITY CONTROL Regular inspection of the work in progress has to be made to ensure that the work is executed to a good standard and in accordance with the specification.

J21/109 SITE SAFETY Guidance given in BS 8000: 1989 and the CDM Regulations: 1994 should be followed. Provision should be made for adequate scaffolding to ensure the safety of operators in accordance with health and safety requirements.
BUILDING FABRIC SUNDRIES

P21  IRONMONGERY

SECURING DEVICES AND FURNITURE

P21/510  LOCKS to external doors to be to BS 3621 and Kitemarked, or better
- Method of operation: as Particular Specification/Schedule

P21/531  EXISTING LOCKS
The removal of any lock is to be agreed with CA before any work commences.
- Original locks must always be returned to the doors from which they came
- Original patent locks are to be specially protected, and recorded. They must be repaired only by a specialist locksmith.

P21/585  BOLTS GENERALLY: Unless specified otherwise, provide bolts:
- To match door furniture and sized to suit height, weight and function of door.
- To secure the first closing leaf on double doors.

P21/642  IRONMONGERY
- The full ironmongery schedule must be agreed with the CA before cutting any mortises, rebates etc. to doors
- All existing ironmongery is to be preserve in situ

P21/720  STOPS: Unless specified otherwise, are required for doors opening against walls other than those fitted with closers with a back check facility.
All existing ironmongery is to be preserve in situ
DISPOSAL SYSTEMS

R10 RAINWATER PIPEWORK AND GUTTERS

To be read with Preliminaries/General conditions.

TYPE(S) OF PIPEWORK/GUTTER

R10/250 ALUMINIUM PIPEWORK FOR EXTERNAL USE: proprietary type to match existing sizes.

R10/251 MILD STEEL SOCKET CLIP FOR EXTERNAL USE TO THE EXISTING RAINWATER PIPE: as Particular Specification/Schedule

R10/370 RAINWATER OUTLETS: as Particular Specification/Schedule
Manufacturer: (provisional) Marley Plumbing and Drainage, Socket Clip (SC41 or SC61)

INSTALLATION

R10/400 BEFORE COMMENCING WORK specified in this section, ensure that:
- Below ground drainage is ready to receive rainwater or that the discharge can be dispersed by approved means to prevent damage or disfigurement of the building fabric.
- Any specified painting of surfaces which will be concealed or inaccessible is completed.

R10/410 INSTALLATION GENERALLY:
- Install pipework/gutters to ensure the complete discharge of rainwater from the building without leaking.
- Obtain all components for each type of pipework/guttering from the same manufacturer unless specified otherwise.
- Provide access fittings and rodding eyes as necessary in convenient locations to permit adequate cleaning and testing of pipework.
- Avoid contact between dissimilar metals and other materials which would result in electrolytic corrosion.
- Do not bend galvanized steel pipes.
- Adequately protect pipework/gutters from damage and distortion during construction. Fit purpose made temporary caps to prevent ingress of debris. Fit all access covers, cleaning eyes and blanking plates as the work proceeds.
- Where not specified otherwise use plated, sherardized, galvanized or non-ferrous fastenings, suitable for the purpose and background, and compatible with the material being fixed.

R10/420 FIXING GUTTERS:
- Set out to a true line and even gradient to ensure no ponding or backfall. Position high points of gutters as close as practical to the roof and low points not more than 50 mm below the roof.
- Position outlets to align with connections to below ground drainage, unless shown otherwise on drawings.
- Provide for thermal and building movement when fixing and jointing, and ensure that clearances are not reduced as fixing proceeds.
- Seal as specified to make watertight.
- Ensure that roofing underlay is dressed into gutter. Mount still fixing guard in the mortar.
R10/450 RAINWATER OUTLETS: Ensure that:
- Outlets are securely fixed before connecting pipework.
- Junctions between outlets and pipework can accommodate all movement in the structure and pipework.

R10/460 FIXING PIPEWORK:
- Fix securely at specified centres plumb and/or true to line.
- Make changes in direction of pipe runs only where shown on drawings unless otherwise approved.
- Fix branches and low gradient sections with uniform and adequate falls to drain efficiently.
- Fix externally socketed pipes/fittings with sockets facing upstream.
- Mount still fixing guard in the mortar.
- Provide additional supports as necessary to support junctions and changes in direction.
- Fix every length of pipe at or close below the socket collar or coupling.
- Provide a load bearing support for vertical pipes at not less than every storey level. Tighten fixings as the work proceeds so that every storey is self supporting and undue weight is not imposed on fixings at the base of the pipe.
- Isolate from structure where passing through walls or floors and sleeve pipes as specified in Section P31.
- Provide for thermal and building movement when fixing and jointing, and ensure that clearances are not reduced as fixing proceeds.
- Fix expansion joint pipe sockets rigidly to the building and elsewhere use fixings that allow the pipe to slide.

R10/465 JOINTING PIPEWORK/GUTTERS:
- Joint using materials, fittings and techniques which will make effective and durable connections.
- Joint differing pipework/gutter systems with adaptors recommended by manufacturer(s).
- Cut ends of pipes to be clean and square with burrs and swarf removed. Chamfer pipe ends before inserting into ring seal sockets.
- Ensure that jointing or mating surfaces are clean, and where necessary lubricated, immediately before assembly.
- Form junctions using fittings intended for the purpose ensuring that jointing material does not project into bore of pipes, fittings and appliances.
- Remove surplus flux/solvent/cement/sealant from joints.

R10/510 ELECTRICAL CONTINUITY: Use clips or suitable standard couplings supplied for the purpose by pipework manufacturer to ensure electrical continuity at all joints in metal pipes with flexible couplings and which are to be earth bonded.

R10/562 INTERNAL PIPEWORK TEST:
- Temporarily seal open ends of pipework with plugs.
- Connect a U tube water gauge and air pump to the pipework via a plug.
- Pump air into pipework until gauge registers 50 mm.
- Allow a period for temperature stabilization, after which the pressure of 50 mm is to be maintained without loss for not less than 5 minutes.
- Please note that this test is to a higher standard than that set in the Building Regulations, to protect the historic fabric.

R10/570 GUTTER TEST: Block all outlets, fill gutters to overflow level and after 5 minutes closely inspect for leakage.

R10/575 RAINWATER PIPEWORK RUNNING IN INTERNAL DUCTS
- to have sealed joints.
- provide means of early indications of leaks and/or overflows.
R11 FOUL DRAINAGE ABOVE GROUND

To be read with Preliminaries/General conditions.

GENERALLY

Ensure all sanitary fittings are removed and all pipework capped off.

TYPE(S) OF PIPEWORK

R11/140 CAST IRON PIPEWORK FOR REPAIR OF EXISTING INSTALLATIONS
- Pipes and fittings: To BS 416:Part 1 with sockets.
- Sizes and Accessories: as Particular Specification/Schedule
- Method of jointing: pack with jute yarn and caulk with cold caulking compound.
- Method of fixing: as Particular Specification/Schedule

R11/165 FITTINGS FOR PIPEWORK
Materials: Non-zincifiable.
Solder: tin/silver solder only. Lead based solder is not to be used.

INSTALLATION

R11/520 INSTALLATION GENERALLY:
- Before commencing work specified in this section, ensure that any specified painting of surfaces which will be concealed or inaccessible is completed.
- Install pipes, fittings and accessories in accordance with BS 5572.
- Obtain all components for each type of pipework from the same manufacturer unless specified otherwise.
- Provide access fittings and rodding eyes as necessary in convenient locations to permit adequate cleaning and testing of pipework.
- Avoid contact between dissimilar metals and other materials which would result in electrolytic corrosion.
- Do not bend plastics or galvanized steel pipes.
- Adequately protect pipework from damage and distortion during construction. Fit purpose made temporary caps to prevent ingress of debris. Fit all access covers, cleaning eyes and blanking plates as the work proceeds.
- Where not specified otherwise use plated, sherardized, galvanized or non-ferrous fastenings, suitable for the purpose and background, and compatible with the material being fixed.

R11/550 FIXING PIPEWORK:
- Fix securely at specified centres plumb and/or true to line.
- Make changes in direction of pipe runs only where shown on drawings unless otherwise approved.
- Fix branches and low gradient sections with uniform and adequate falls to drain efficiently.
- Fix externally socketed pipes/fittings with sockets facing upstream.
- Provide additional supports as necessary to support junctions and changes in direction.
- Fix every length of pipe at or close below the socket collar or coupling.
- Provide a load bearing support for vertical pipes at not less than every storey level. Tighten fixings as the work proceeds so that every storey is self supporting and undue weight is not imposed on fixings at the base of the pipe.
- Isolate from structure where passing through walls or floors and sleeve pipes as specified in section P31.
- Provide for thermal and building movement when fixing and jointing, and ensure that clearances are not reduced as fixing proceeds.
- Fix expansion joint pipe sockets rigidly to the building; elsewhere use fixings that allow the pipe to slide.

R11/560 JOINTING PIPEWORK:
- Joint using materials, fittings and techniques that will make effective and durable connections.
- Joint differing pipework systems with adaptors recommended by manufacturer(s).
- Cut ends of pipes to be clean and square with burrs and swarf removed. Chamfer pipe ends before inserting into ring seal sockets.
- Ensure that jointing or mating surfaces are clean, and where necessary lubricated, immediately before assembly.
- Form junctions using fittings intended for the purpose ensuring that jointing material does not project into bore of pipes, fittings and appliances.
- Remove surplus flux/solvent/cement/sealant from joints.

R11/710 ELECTRICAL CONTINUITY: Use clips supplied for the purpose by pipework manufacturer to ensure electrical continuity at all joints in metal pipes with flexible couplings and which are to be earth bonded.
Z10 PURPOSE MADE JOINERY

To be read with Preliminaries/General conditions.

Z10/110 FABRICATION GENERALLY:
- Fabricate joinery components to BS 1186:Part 2.
- Form sections out of the solid when not specified otherwise. Carefully machine timber to accurate lengths and profiles, free from twist and bowing. After machining, surfaces to be smooth and free from tearing, wooliness, chip bruising and other machining defects.
- Assemble with tight, close fitting joints to produce rigid components free from distortion.
- Screw heads to be countersunk not less than 2 mm below timber surfaces which will be visible in completed work. All screws to have clearance holes. Screws of 8 gauge or more and all screws into hardwood to have pilot holes.

Z10/120 CROSS SECTION DIMENSIONS of timber shown on drawings are nominal sizes unless stated otherwise. Reduction to finished sizes to be to BS 4471 for softwoods and BS 5450 for hardwoods. Deviation from the stated sizes will not be permitted unless prior approval is given.

Z10/130 PRESERVATIVE TREATED TIMBER:
- Carry out as much cutting and machining as possible before treatment.
- Retreat all timber which is sawn along the length, ploughed, thicknessed, planed or otherwise extensively processed.
- Treat surfaces exposed by minor cutting and drilling with two flood coats of a solution recommended for the purpose by main treatment solution manufacturer.

Z10/140 MOISTURE CONTENT of timber and wood based sheets to be maintained during manufacture and storage, within the range specified for the component.

Z10/250 FINISHING AND PROTECTING:
- Sand all joinery to give smooth, flat surfaces suitable to receive specified finishes. Arrises to be eased unless specified otherwise.
- Before assembly, seal all end grains for external components with primer or sealer as specified in section M60 and allow to dry.
- Protect completed joinery against damage, dirt, moisture and other deleterious substances.

Z11 PURPOSES MADE METALWORK

To be read with Preliminaries/General conditions.

Z11/110 MATERIALS GENERALLY:
- Grades of metals, section dimensions and properties to be to the appropriate British Standard. When not specified, select grades and sections appropriate for the purpose.
- Prefinished metal may be used if methods of fabrication do not damage or alter appearance of finish and finish is adequately protected.
- Fastenings to be to the appropriate British Standard and, unless specified otherwise, to be of the same metal as the component, with matching coating or finish.
Z11/120  **FABRICATION GENERALLY:**
- Fabricate components carefully and accurately to ensure compliance with design and performance requirements.
- Do not permit contact between dissimilar metals in components which are to be fixed where moisture may be present or occur.
- Finished components to be rigid and free from distortion, cracks, burrs and sharp arrises. Moving parts must move freely and without binding.
- Unless specified otherwise, mitre corner junctions of identical sections.

Z11/130  **COLD FORMED WORK:** Use brake presses or cold rolling to produce accurate profiles with straight arrises.

Z11/170  **WELDING/BRAZING GENERALLY:**
- Thoroughly clean surfaces to be joined.
- Ensure accurate fit using clamps and jigs where practicable. Use tack welds only for temporary attachment.
- Make joints with parent and filler metal fully bonded throughout with no inclusions, holes, porosity or cracks.
- Prevent weld spatter falling on surfaces of materials which will be self-finished and visible in completed work.
- Remove all traces of flux residue, slag and weld spatter.

Z11/170  **SITE WELDING/BRAZING:**
All welding or brazing must take place off the site. In exceptional circumstances, the CA must give written permission for site welding or brazing, and the HOT WORK permit must be followed.

Z11/180  **WELDING OF STEEL:** Metal arc welding to BS 5135, or other methods subject to approval.

Z11/250  **FINISHING WELDED/BRAZED JOINTS:**
- Butt joints which will be visible in completed work to be smooth, flush with adjacent surfaces.
- Fillet joints which will be visible in completed work to be executed neatly. Grind smooth where specified.

Z11/310  **APPLYING COATINGS:**
- Apply after fabrication is complete and all fixing holes have been drilled, unless otherwise specified.
- Before applying coating remove all paint, grease, flux, rust, burrs and sharp arrises.
- Make good all defects which would show after application of coating and finish surfaces smooth.

**Z12  PRESERVATIVE/FIRE RETARDANT TREATMENT**

To be read with Preliminaries/General conditions.

Z12/110.  **GENERALLY:**
- Application to be carried out after cutting and machining, but before assembly, by a processor licensed by the treatment solution manufacturer for the specified treatment.
- For each batch of timber, provide a certificate of assurance that treatment has been carried out as specified.
- Hand the certificate to the CA for inclusion in the Building Maintenance manual.

Z12/120  **BWPDA COMMODITY SPECIFICATIONS,** where specified, are those defined
in the latest edition of the British Wood Preserving and Damp-proofing Association Manual. Solution strengths and treatment cycles to be selected to achieve the service life (if specified) and to suit timber treatability.

Z12/130. CUTTING PRESERVATIVE TREATED TIMBER:
- Treat all timber surfaces exposed by boring, cross-cutting etc. subsequent to preservative treatment with two liberal brush or spray applications of the preservative used on the initial treatment of the timber, or
- with a solution recommended by the manufacturer.

Z12/160. ORGANIC SOLVENT PRESERVATIVE TREATMENT:
- Moisture content of timber at time of treatment to be as specified for the component at time of delivery. After treatment, timber to be surface dry before use.
- Application: Double vacuum/low pressure in compliance with the principles of Bs 5707: Part 3, to the pressures and periods given for performance category A in Table 5 of BS 5589.
- Preservative solution manufacturer and reference: to be class F/N solution to BS 5707, Part 1 and manufactured by a BSI registered firm
Preservative must not contain TBTO or Lindane

Z12/170. DRYING OUT:
- Allow preservative to dry out to avoid damage to subsequently applied coatings, sealants, adhesives etc.
- Ensure drying out period is of adequate duration to allow for the evaporation of solvents before the timber is installed, especially in roofing applications.
- Store treated heavy sections and thick boards in separate well ventilated areas for the drying out period.

Z20  FIXINGS, ADHESIVES

To be read with Preliminaries/General conditions.

Z20/110  FIXING GENERALLY: Use fixing and jointing methods and types, sizes, quantities and spacings of fastenings which are suitable having regard to:
- Nature of and compatibility with product/material being fixed and fixed to,
- Recommendations of manufacturers of fastenings and manufacturers of components, products or materials being fixed and fixed to,
- Materials and loads to be supported,
- Conditions expected in use,
- Appearance, this being subject to approval.

Z20/120  FASTENINGS for materials and components forming part of external construction to be of corrosion resistant material or have a corrosion resistant finish.

Z20/130  FASTENINGS for materials and components:
- Forming part of external construction but not directly exposed to the weather to be of corrosion resistant material or have a corrosion resistant finish.
- Directly exposed to the weather to be of corrosion resistant material.

Z20/140  FIXING THROUGH FINISHES: Ensure that fastenings and plugs (if used) have ample penetration into the backing.

Z20/160  CRAMP FIXING:
- Fix with stainless or galvanized steel strip cramps as BS 1243 vertical twist ties except with no twist, split one end only and once bent.
- Position cramps 150 mm from each end of jambs and at 600 mm maximum centres.
- Secure cramps to frames with two sherardized screws and fully bed in mortar.

Z20/230 PELLETING: Countersink screw heads 6 mm below timber surface and glue in grain-matched pellets not less than 6 mm thick, cut from matching timber. Finish off flush with face.

Z20/510 ADHESIVES:
- Adhesive types: As specified in the relevant section.
- Surfaces to receive adhesive to be sound, unfrozen, free from dust, grease and any other contamination likely to affect bond. Where necessary, clean surfaces using methods and materials recommended by adhesive manufacturer.
- Surfaces to be of sufficient smoothness and evenness to suit gap filling and bonding characteristics of adhesive. Adjust as necessary.
- Ensure that operatives observe manufacturer’s and statutory requirements for storage and safe usage of adhesives.
- Do not use adhesives in unsuitable environmental conditions or beyond the manufacturer’s recommended time period.
- Apply adhesives using recommended spreaders/applicators to ensure correct coverage. Bring surfaces together within recommended time period and apply pressure evenly over full area of contact surfaces to ensure full bonding.
- Remove surplus adhesive using methods and materials recommended by adhesive manufacturer and without damage to affected surfaces.

Z21 MORTARS

To be read with Preliminaries/General conditions.

Z21/110 MORTAR MIX PROPORTIONS: the original mortar of the building has to be analyzed to find the original mix proportions to be used during repoint works. Generally – cement:lime:sharp is 1:2:8/9.
- see CA for advice on these matters.

Z21/131. READY MIXED LIME: SAND FOR CEMENT GAUGED MORTARS:
- Generally not recommended for conservation work because hydrated lime is often used.
- To be used only when required by planning/listed building consent.

Z21/160 CEMENT FOR MORTAR:
- Generally not recommended for conservation work.
- To be used only when required by planning/listed building consent
- When not specified otherwise, to be Portland cement or Portland blastfurnace cement, to class 42.5 or 52.5, manufactured and supplied under the BSI Kitemark scheme for cement. All cements must comply with the appropriate British Standard.

Z21/180 ADMIXTURES: Do not use in mortar unless specified or approved. Do not use calcium chloride or any admixtures containing calcium chloride. Admixtures, if specified, to be to BS 4887.

Z21/200 SITE STORAGE OF CEMENT GAUGED MORTAR MATERIALS
- Store different sands and aggregates in different stockpiles on hard clean bases which allow free drainage.
- Store factory produced premixed lime:sand for mortars and ready-to-use retarded mortars in covered containers to prevent excessive drying out or wetting.
- Store bags of cement and hydrated lime in dry conditions, raised off the ground and not touching damp surfaces. Do not use cement or hydrated lime affected by damp.
- Avoid intermixing and contamination between stored materials and other building materials, debris or other deleterious matter.

Z21/210 MAKING CEMENT GAUGED MORTAR:
- Keep plant and banker boards clean at all times.
- Measure materials accurately by volume using clean gauge boxes. Proportions of mixes are for dry sand; allow for bulking if sand is damp.
- Mix ingredients thoroughly to a consistence suitable for the work and free from lumps. Mortars containing air entraining admixtures must be mixed by machine, but do not overmix.
- Do not mix mortar when the air temperature is at or below 3 degC and falling or below 1degC and rising.
- Use mortar within about two hours of mixing at normal temperatures. Use retarded mortar within the time and site temperatures recommended by the manufacturer. Mortar may be retempered to restore workability, but only within these time limits.

LIME: SAND MORTARS

Z21/310 MORTAR MIX PROPORTIONS and other particular requirements are specified elsewhere, and are subject to planning permissions/listed building consents
- See contract administrator for advice on these matters.

Z21/320 SAND FOR LIME:SAND MORTARS:
- Sharp, well-graded and conforming to the methods of sampling and testing and quality requirements of BS 882 or BS 1200 unless specified otherwise.
- Source(s)/type(s) of sand are specified elsewhere.
- Type: to be determined by specialist analysis
  To be sharp, well graded, well washed, with no silt or salt contamination.

Z21/330 READY PREPARED LIME PUTTY:
- Use lime putty slaked directly from CL 90 (high calcium) quicklime to BS 890, using an excess of water and matured in pits/containers that allow excess water to drain away.
- Density of matured lime putty: 1.3 to 1.4 kg/litre
- Maturity of lime putty before use: not less than 30 days after slaking.

Z21/335 READY PREPARED LIME PUTTY:
- Ready slaked lime putty as supplied by
  - Bleaklow Industries Ltd
    Hassop Avenue, Hassop, Bakewell, Derbyshire DE45 1NS
  - or
  - Rose of Jericho at St Blaise Ltd
    Westhill Barn, Evershot, Dorchester, Dorset DT2 0LD
  - or equivalent
  - Maturity of lime putty before use: not less than 30 days

Z21/340 POZZOLANIC ADMIXTURES FOR NONHYDRAULIC LIME: SAND MORTARS
- Type: as Particular specification, and as recommended by the lime manufacturer, who should be consulted for advice
- Proportions: as Particular specification
- Mix thoroughly into lime:sand mortar during knocking up stage.
SITE STORAGE OF LIME: SAND MORTAR MATERIALS
- Store different sands and aggregates in different stockpiles on hard clean bases which allow free drainage.
- Store bags of hydrated lime in dry conditions, raised off the ground and not touching damp surfaces. Do not use hydrated lime affected by damp.
- Store ready prepared nonhydraulic lime:sand mortar either on clean bases or in clean containers that allow free drainage. Keep covered to prevent drying out or wetting and protect from frost.
- Avoid intermixing and contamination between stored materials and other building materials, debris and other deleterious matter.

MAKING LIME: SAND MORTARS GENERALLY:
- Use operatives who are skilled and experienced in the making and use of lime:sand mortars. Provide evidence of their experience to the CA on request.
- Keep plant and banker boards clean at all times. Avoid contamination of lime:sand mortar by other materials or by any set material (including Portland cement).
- Measure materials accurately by volume using clean gauge boxes or clean undamaged buckets.
- Do not mix mortar when the air temperature is at or below 5°C and falling or below 3°C and rising.
- Site slaking of lime is not recommended.

SITE PREPARATION OF NONHYDRAULIC LIME: SAND MORTAR:
- Lime putty: As clause 330 or 335
  - Thoroughly mix lime putty and sand together by compressing beating and chopping using a roller pan mixer, or other approved mixing method. Do not add water.
  - Store mortar in conditions that prevent drying out or wetting.
  - Allow to mature for not less than 90 days.

READY MIXED NONHYDRAULIC LIME: SAND MORTAR
- Manufacturer and reference: To be supplied ready mixed by Bleaklow Industries or Rose of Jericho or equivalent.
  - ready mixed mortar to comprise:
    - Lime putty slaked directly from quicklime to BS 890 and sand, or
    - Quicklime to BS 890 slaked directly with sand.
    - Do not use hydrated nonhydraulic lime powder.
  - Maturity of mortar before use to be not less that 90 days.
    - Provide evidence of maturity, for each batch of mortar at time of delivery to site, to the CA on request.
  - Store mortar in conditions that prevent drying out or wetting.

KNOCKING UP NONHYDRAULIC LIME: SAND MORTAR:
When required for use, thoroughly knock up mortar to a workable consistency by compressing, beating and chopping using a roller pan mixer, or other approved mixing method. Do not add water.
- During use, prevent drying out or wetting. Retain workability by chopping and beating.

SITE PREPARATION OF HYDRAULIC LIME: SAND MORTAR:
- Hydraulic lime: as Particular specification
  - Manufacturer and reference: as Particular specification
  - Thoroughly mix eminently hydraulic hydrated lime powder with sand, first in the dry state and then with water. Follow the lime manufacturer’s recommendations for each stage of the mix. Add only sufficient water to produce a workable mix.
  - Use mortar within the time limits recommended by the lime manufacturer. Do not use mortar that has begun to stiffen.
**Z22 SEALANTS**

To be read with Preliminaries/General conditions

**Z22/110 SEALANT TYPES:** As specified in the relevant section.

**Z22/120 SUITABILITY OF JOINTS:** Before commencing, check that:
- Joint dimensions are within limits specified for the sealant.
- Surfaces are smooth and undamaged.
- Preparatory work which must be done before assembly of the joint has been carried out

Inform CA if joints are not suitable to receive sealant and submit proposals for rectification

**Z22/130 PREPARING JOINTS:**
- Clean surfaces to which sealant must adhere using methods and materials recommended by sealant manufacturer.
- Remove all temporary coatings, tapes, loosely adhering material, dust, oil, grease and other contaminants which may affect bond.
- Keep joints clean and protect from damage until sealant is applied.
- Backing strip, bond breaker, primer: Types recommended for the purpose by sealant manufacturer.
- Insert backing strips and/or bond breaker tape into joint leaving no gaps.
- Cover adjacent surfaces with masking tape to prevent staining and protect surfaces which would be difficult to clean if smeared with primer or sealant.

**Z22/160 APPLYING SEALANTS:**
- Ensure that operatives observe manufacturer's and statutory requirements for storage and safe usage of sealants.
- Use equipment and methods recommended by sealant manufacturer and apply within the recommended application life of primer and sealant, and the recommended air and substrate temperature ranges.
- Do not apply to damp surfaces (unless recommended otherwise), to surfaces affected by ice or snow or during inclement weather. Do not heat joints to dry them or raise the temperature.
- Fill joints completely, leaving no gaps, excluding all air and ensuring firm adhesion of sealant to required joint surfaces. Tool the sealant to a neat, slightly concave profile unless specified otherwise.
- Protect until cured.