B10 ACCESS SCAFFOLDING, TEMPORARY ROOFS AND SUPPORT

To be read with Preliminaries and General Conditions

GENERALLY

B10.050A SCOPE OF THIS SECTION: This section deals with specific requirements of the contractor's works temporary roof and side enclosure and the associated supporting structure. This section is not intended to deal with contractors works temporary propping and support to parts of the structure

B10.052A SUPERVISION: to ensure maintenance of satisfactory quality and progress, work is to be under the full-time control of a trained and competent working trade foreman holding a current SMTS Certificate.

B10.100A HISTORIC SENSITIVITY OF THE BUILDING: The building is Grade 2 Listed and is to be treated with special consideration and care reflecting its historic importance.
The roofs are covered with slates with parapet valleys laid to leadwork

B10.101A REQUIREMENTS:
- An access scaffold, compliant with 'The Work at height Regulations 2005 and BS12811-1 is to be provided.
- Allow for the provision of an electrical, moveable mast hoist capable of lifting masonry and lead rolls form ground to roof parapets.
- **The scaffold must be based on a clear span structure, no loading shall be taken off the building.**
- **No structural anchors or drilled ties are to be taken off the walls.**
- Provide external scaffolding with working platforms as appropriate for the works to the roof structure over.
- Upper scaffold lifts are to be set at height and ctrs to allow all roofing works to be undertaken.
- Internal ladder access between each working platform only.
- Lifting rail to be provided to top platform.

B10.104A MODIFICATION TO ERECTED ACCESS STRUCTURES: Prior to modifying the construction of the any erected scaffold, agree with the Designer and the CA the need, extent, duration and if appropriate, the cost of any adaptation.

B10.105A REMOVAL: Give the CA one weeks written notice of the intention to strike scaffolding.

B10.107A BRITISH STANDARDS: All British Standards and British Standard Codes of Practice referred to in this document are taken to be those current at the time of erection.

DESIGN

B10.201A PROPOSALS Submit at the time of tender, a method statement detailing the intended means of providing the temporary facilities. Indicate the method of supporting the scaffold structure, supports are not to be made through or onto existing roofs. Roofs are to be designed to clear span the building.

B10.204A SUBMISSION OF DRAWINGS AND CALCULATIONS: Submit in duplicate to the CA for appraisal, drawings and calculations of the proposals for the temporary works. Modify such drawings and calculations until the CA is satisfied that works may proceed on site. Satisfy the CA that the permanent works can safely take all loads. Allow two weeks for the CA`s approval process.
In addition to the works contractor's own details, the contractor is to provide a full structural design and check certificate by an independent Engineer.

B10.207A SCAFFOLD PLATFORM LOADINGS shall be appropriate to the designation of the scaffold and proposed work operations.

B10.208A WIND LOADING to be in accordance with BS 5973. Return period for wind loading minimum 2 years. Ensure the performance of any temporary localised sheeting complies with the same wind loading as supporting scaffold. Make provision to accept movement without consequential damage to the structure.

B10.209A SNOW LOADS to be applied as appropriate to BS 6399 Part 3:1988.

B10.211A LOADING ON EXISTING STRUCTURES: Loading is not to be applied to the building.

B10.212A TAKING RESTRAINT FROM THE EXISTING STRUCTURES: Not permitted

MATERIALS

B10.300A ALL MATERIALS USED to be adequate for the purpose, to the satisfaction of the CA and conform to the latest applicable British Standard.

B10.301A METAL SCAFFOLDING to BS 1139 Pts.1 to 4 1982: All scaffolding to be hot dipped galvanised. Aluminium scaffold tubing may be permitted with the prior agreement of the CA.

ERECTION AND WORKMANSHIP

B10.400A ERECT and dismantle in accordance with Guidance Notes TG20:04 and SG4:10 and all relevant Safety and British Standards. Any proposals to erect, adapt or dismantle not in accordance with the previously agreed details are to be submitted to the CA. See also clause 105A.
Obtain all consents and pay all costs associated with the erection of scaffold and maintain all temporary lighting and signage.

B10.401A RESTRICTED ACCESS AND WORKING AREA: The Building is situated off the public highway and only pedestrian access is available to the perimeter of the building. There is limited available working area for the prefabrication of scaffold frames at ground level for subsequent craning onto the roof.

B10.404A MANHOLES AND FOUNDATIONS: Where bearing on temporary filled, soil or neighbouring grass areas, use railway sleepers or similar sized treated timbers as sole plates. Do not erect scaffold standards or sole plates over manhole or chamber covers and allow clear access to these areas. Do not bear on graves.

B10.405A POINTS OF CONTACT: All tubes touching or within 25mm of the face of the permanent work are to be fitted with plastic caps to prevent rust staining on the building.

B10.407A CUTTING OF METAL SCAFFOLD COMPONENTS:
- Cutting off all metal scaffold components is subject to the hot work permit scheme.
- Where cutting metal scaffold components adjacent to the building, protect the stonework from arising filings and swarf to prevent against subsequent rust staining.

B10.408A EXISTING ROOF CONSTRUCTIONS: The existing roof finishes are particularly vulnerable to damage and subsequent water leaks. Extreme care is to be exercised in accessing roof gutters in particular and the placement of scaffold supports.

B10.409A ADEQUATE PRECAUTIONS TO BE TAKEN to protect both workmen and public from falling debris. Precautions to be taken to prevent personal injury where temporary works are erected in or near areas to which public have access.

B10.411A PREVENTION OF UNAUTHORISED ACCESS: Prevent unauthorised access to all temporary works. **Provide 3m high vertical galvanised sheeting to entire perimeter and remove ladders at the end of each working period.**

B10.412A MAINTENANCE: The contractor is to certify that the scaffold is fit for use using the Scaftag labelling system. The contractor is to undertake inspection of the scaffold weekly and following storms.

B10.452A REMOVAL OF SHEETING: Sheeting is not to be removed until permanent roof coverings, gutters, catchpits and rainwater discharge is complete.

LIGHTNING PROTECTION EARTHING OF SCAFFOLD SYSTEM

B10.501A RESPONSIBILITY FOR THE DESIGN AND INSTALLATION: Assume the responsibility for the design and installation of the lightning protection notwithstanding the any acceptance of design and details by the CA.

B10.502A DESIGN REQUIREMENTS: The complete scaffold installation is to comply with the requirements of BS 6651 Protection of Structures Against Lightning.

B10.503A EXISTING BUILDINGS AND STRUCTURES: Inspect existing buildings and structures and bond with the head and base of all existing down conductors.

B10.504A INSTALLATION: The installation of the temporary lightning protection and earthing system is to be undertaken at an early stage of erection and certified by an approved contractor. The final installation is to be clearly labelled. All unpainted/coated ferrous components are to be isolated from the building to prevent rust staining.

B10.510A ALREADY PROTECTED STRUCTURES bond temporary works to head and base of all adjacent down conductors. Apply test to relevant British Standard to the existing system.

Amendments to section B10				
Reference	Clause	Description	Date	By

C10 TAKING DOWN STRUCTURES

To be read with Preliminaries/General Conditions and the Schedule.

GENERAL REQUIREMENTS

C10.050A HISTORIC SENSITIVITY OF THE BUILDING: The building is Grade 2 Listed and is to be treated with special consideration and care reflecting its historic importance.

EXTENT OF WORKS

C10.120A EXTENT OF WORKS
- Taking up of existing valley carcassing and lead coverings

C10.126A STRIPPING OF EXISTING ROOF COVERINGS.
-Location: Roof slopes at areas indicated on layout plan.
-Carefully remove and set aside of all roof slates, battens and felt underlay.

C10.127A STRIPPING OF EXISTING ROOF LEADWORK.
- Location: All roof abutment gutters and cover flashings at aresa indicated on layout plan.
- Carefully remove and dispose of all leadwork.

C10.128A REMOVING OF CARCASING
- Location: All roof gutters including rotten main structure timbers below.
- Rotten pediment timbers
- Carefully remove and dispose of all timberwork to areas indentified.
- Clean away all debris and thoroughly vacuum out all valley areas.

TAKING DOWN WORKS

C10.310A WORKMANSHIP GENERALLY:
- 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, are to be experienced in the assessment of the risks involved and in the methods of demolition to be used.
- All site staff must be briefed on the historic sensitivity of the buildings and the need to undertake works with special consideration as set out in this section.
- Before commencing works, ensure all operatives are clear on the extent of taking down and that the protection of elements to remain has been undertaken.
- Prior to demolition works on site provide to CA method statement for works.

C10.311A TAKING DOWN AND REMOVAL METHODS:
- Take down components without causing damage to remaining structure. Wherever possible unscrew components and withdraw nails. Place protective blocks behind crowbars when levering against walls and linings.

C10.317A **HOT WORKING: Hot working and burning off will only be permitted by prior approval of the CA. Submit to the CA a method statement detailing the method of hot working, procedures and precautions to be taken.**

C10.318 GAS OR VAPOUR RISKS: Take adequate precautions to prevent fire or explosion caused by gas or vapour.

C10.319 HEALTH HAZARDS: Take adequate precautions to protect site operatives and the general public from health hazards associated with dangerous fumes and dust arising during the course of the Works.

C10.342A STRUCTURES TO BE RETAINED:
- Adequately protect parts of existing structures that are to be kept in place.

- Cut away and strip out the minimum necessary and with care to reduce the amount of making good to a minimum.
- Prevent debris from overloading any part of the structure that is not to be taken down.

C10.380 DANGEROUS OPENINGS: Illuminate and protect as necessary.

C10.390A ASBESTOS BASED MATERIALS:
Report immediately to the CA any suspected asbestos based materials discovered during demolition work. Avoid disturbing such materials. Agree with the CA methods for safe removal.

C10.410 UNKNOWN HAZARDS: Inform the CA of any unrecorded voids, tanks, chemicals, etc., discovered during demolition work. Agree with the CA methods for safe removal, filling etc.

C10.440 COMPLETION: Clear away all debris and leave the site in a tidy condition on completion.

MATERIALS ARISING

C10.510A OWNERSHIP: Unless scheduled otherwise, components and materials arising from the demolition work are to become the property of the Contractor. Remove from site as work proceeds.

C10.512B STOCKPILING: Stockpiling of materials within the site is not permitted.

C10.513A DISPOSAL OF MATERIALS: Dispose of materials arising from the demolition work making use of approved reclamation of recycling facilities.

Amendments to section C20				
Reference	Clause	Description	Date	By

C20 ALTERATIONS SPOT ITEMS

To be read with Preliminaries/General Conditions and the Schedule

GENERAL REQUIREMENTS

C20.050A HISTORIC SENSITIVITY OF THE BUILDING: The building is Grade 2 Listed and is to be treated with special consideration and care reflecting its historic importance.

EXTENT OF WORKS

C20.120A EXTENT OF WORKS:
- Raking out mortar pointing to external building stonework.
- Removal and re-rendering of stonework.

C20.317A HOT WORKING: Hot working, burning off and disk cutting will only be permitted by prior approval of the CA. Submit to the CA a method statement detailing the method of hot working, procedures and precautions to be taken.

C20.318 GAS OR VAPOUR RISKS: Take adequate precautions to prevent fire or explosion caused by gas or vapour.

C20.319 HEALTH HAZARDS: Take adequate precautions to protect site operatives and the general public from health hazards associated with dangerous fumes and dust arising during the course of the Works.

C10.342A STRUCTURES TO BE RETAINED:
- Adequately protect parts of existing structures that are to be kept in place.
- Cut away and strip out the minimum necessary and with care to reduce the amount of making good to a minimum.
- Prevent from overloading any part of the structure that is not to be taken down.

C20.440 COMPLETION: Clear away all debris and leave the site in a tidy condition on completion.

MATERIALS ARISING

C20.510A OWNERSHIP: Unless scheduled otherwise, components and materials arising from the demolition work are to become the property of the Contractor except where otherwise provided. Remove from site as work proceeds.

Amendments to section C20				
Reference	Clause	Description	Date	By

C30 STONEWORK PROTECTION

To be read with Preliminaries/General conditions.

C30.100A HISTORIC SENSITIVITY OF THE BUILDING: The Town Hall is Grade 2 listed and is to be treated with special consideration and care reflecting its historic importance.

C30.110 GENERALLY: Before starting work:
- Examine all available information.
- Survey the structure, site and surrounding area.
- Submit method statements to the CA covering any relevant matters raised in the design brief.
- Ensure that all statutory notices have been given and licenses obtained.
- Liaise as required with the CA to ensure full co-ordination of all aspects of the design.

C30.120 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.
- Identify any areas of variance with information supplied and seek appropriate instructions.
- Agree the commencement condition survey record with the CA.

C30.140 EXTENT OF SUPPORT WORK:
- Provide support systems as necessary.
- Before starting work, submit detailed proposals including drawings and calculations for all systems to the CA, and resolve any amendments proposed.
- Accept responsibility for the adequacy and stability of support systems and thereby the integrity of supported structure for the period from commencement of erection to completion of dismantling of support systems.

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 are to be experienced in the methods of erection and maintenance of support systems to be used.

C30.220 ERECTING SUPPORT SYSTEMS:
- Locate positions of existing and services which may be affected by support systems. Provide any necessary temporary diversions.
- Prevent excessive loadings from foundations of support systems being imposed onto foundations of structure to be kept in place.
- Erect support systems and connect to structure to be kept in place taking all necessary precautions to prevent damage, and taking due account of movement of structure which may occur before, during and after demolition.
- Promptly repair any damage caused to adjoining property by erection or connection of support systems. Make good to ensure safety, stability, weather protection and security.
- Report to the CA any damage caused to retained facades by erection or connection of support systems. Agree methods of repair with the CA.
- Check support systems at agreed stages during erection for compliance with design proposals.

C30.230 UNKNOWN HAZARDS: Inform the CA 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.

C30.240 SUPPORT SYSTEMS:

- Sequence: Complete removal of pinnacles and insertion of structural stitching rods prior to any required/scheduled re-building of stonework.

C30.310 MAINTAINING SUPPORT SYSTEMS:
- Provide safe access and safe places of work in the support systems for inspection and maintenance.
- Regularly inspect and maintain support systems, making good ties, wedges, connections, corrosion protection, etc. as necessary.
- Adequately protect support systems and debris netting from impact damage by vehicles, plant and site operations.
- Prevent access of unauthorised persons onto support systems. Leave safe outside working hours.

C30.320 MAINTAINING SUPPORTED STRUCTURE:
- Regularly inspect and monitor supported structure to ensure stability. Report any significant movement or deterioration of the fabric of supported structure to the CA.
- Agree any necessary remedial work with the CA.
- Adequately protect supported structure from damage by site operations and from staining due to corrosion of support systems.

C30.410 DISMANTLING SUPPORT SYSTEMS: When all permanent connections between supported structure and new construction have been made inform the CA and obtain any required permission to disconnect and dismantle support systems.

C30.420 COMPLETION CONDITION SURVEY:
- After disconnection of support systems, survey and record the state of structure kept in place.
- Ensure that all defects caused by or due to support systems have been remedied.
- Agree the completion condition survey record with the CA.
- Ensure no temporary fixings are left in place.

C30.430 MAKING GOOD: Repair any connection holes made in the structure.

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.

Amendments to section C30				
Reference	Clause	Description	Date	By

C45 REPAIR AND CONSERVATION OF ASHLAR STONEWORK

To be read with Preliminaries/ and General Conditions.

GENERAL

C45.100A HISTORIC SENSITIVITY OF THE BUILDINGS AND STRUCTURES: The Town Hall is a Listed Structure (Grade 2). It is to be treated with special consideration and care reflecting its historic importance, particularly in the selection of the workforce employed on the works.

C45.102A SUPERVISION: this significantly sensitive element of the works is to be under the close constant control of competent trade supervisors to ensure maintenance of satisfactory 1

C45.105A CRAFTSMAN: Cutting, dressing, laying, jointing and related works are to be undertaken by skilled masons.

C45.107A ARCHAEOLOGICAL ATTENDANCE: Allow access to the works by the Site Archaeologist employed directly by the client to undertake a watching brief for items of historic significance. Where the contractor finds items/areas which he considers may be of archaeological interest, he is to suspend his work in that area and advise the CA.

CONTROL TRIALS, REPAIRS AND SAMPLES

C45.111B CONTROL REPAIRS: Prior to commencement of the works contained in this section, undertake control repairs of each of those elements listed below at locations agreed with the CA. Modify repairs until a result is achieved to the satisfaction of the CA.
Control repairs are to include the following elements for granite

- Re-pointing, the contractor is to allow for the provision of a pallet of up to six 1.0m lengths of re-pointing.

C45.112A ANALYSIS: At 3no. locations agreed with the CA carefully cut out sections of historic pointing mix. Bag and identify for further reference and submit to a test laboratory approved by the CA for analysis. Submit test report to the CA. Make good areas of sampling in approved pointing mix.

C45.113A SAMPLES OF MATERIALS: Provide the CA with samples of the following for approval:-

- Stone intended for piecing-in and re-facing.
- Lime mortar repair: cured mortars indicating their intended locations and precise description of constituents and mix proportions. The contractor is to note the variety of colours and textures required.
- Bedding/Jointing/Pointing: produce a sample display panel and reference diagram illustrating:

a) Samples of existing mortars noting from where they were removed;
b) Samples of proposed cured mortars for approval with precise descriptions of constituents and mix proportions.

Stone samples are to be sufficiently large enough to show natural variations. Ensure delivered items match samples. See also control trial repair requirements clause 111A.

CONTRACTORS DESIGN

1C45.121A CONTRACTORS DESIGN OF FIXINGS: Assume the responsibility for the assessment of loading, design and installation of pin and dowel fixings. This responsibility is notwithstanding any acceptance of design or details by the CA.

C45.122A SUBMISSION OF DRAWINGS AND CALCULATIONS: Where required by the CA submit design drawings and calculations in duplicate at least two weeks prior to ordering. Drawings are to indicate profile of sections of stone to be retained, the relative positions of

fixings and penetration to supporting elements. Calculations are to indicate all assumptions made and are to be checked and certified by an independent engineer.

STONEWORK CHARACTERISTICS, SOURCING AND PROCUREMENT

C45.135B STONE CHARACTERISTICS: Stone is to be free from cleavage vents, cracks, fissures, discoloration affecting strength, durability or appearance. Thoroughly seasoned and sawn and machined where appropriate before delivery to site in accordance with cutting schedules, shop drawings and profiles supplied by the Contractor.
Granite:
- To be of the appearance to match existing granite and subject to the submission of approved samples required at clause 113A.

C45.136A BED IDENTIFICATION OF QUARRIED STONE: Clearly mark each block to indicate the natural bed, way up and position in the finished work.

C45.137A PROFILES: Where possible from original stones or where damaged stones cannot be measured or are missing, from adjacent similar stones, take all necessary profiles and templates on durable materials, take all necessary face dimensions and produce drawings. Submit completed profiles and drawings to CA. Carefully and indelibly mark so that their identity and location are in no doubt. Templates and drawings are to be passed to the CA upon completion of work.

SUNDRY ITEMS

C45.141A BITUMEN SOLUTION: to BS6949, type 1 of brushing consistency.

C45.142A REINFORCING MESH: Austenitic stainless steel grade 316L

C45.143A REINFORCING WIRE: Austenitic stainless steel wire grade 316L for pinning spalls and mortar repairs.

C45.144A REINFORCING PINS: Austenitic stainless steel grade 316L 6mm diameter, ribbed or hammered for grip for stitching large spalls or fractures.

C45.145A REINFORCING PANELS, RODS AND PINS: Austenitic stainless steel grade 316L of sizes to contractor design as clause 121A.

C45.146A RESIN: to BS6319 DD88; for resin pinning.

C45.147A BIOCIDE: Iodopropynyl Butyl Carbamate, Cementone Beaver Ltd. Tel: 01280 823823 Microtech Masonry Biocide or other approved by the CA.

TRANSPORT, HANDLING AND STORAGE

C45.151A TRANSPORT AND HANDLING:
- Transport stone with least handling possible.
- Stack carefully on vehicle with adequate packing and spacers.
- Move and handle stones for reinstatement/replacement, loading, unloading and lowering or hoisting into position by adopting such necessary methods to prevent damage to stones.

C45.152A STORAGE:
- Store clear of ground to prevent leaking in of ground salts and/or moisture staining.
- Protect from frost in winter.
- Use spacers to allow the free air flow between stones.
- Prevent saturation from rain by the provision of adequate coverings.

WORKMANSHIP GENERALLY

C45.160A GENERALLY:

- Store dressed stone clear of the ground, protect from inclement weather and keep dry. Prevent soiling, chipping and contamination by salts and other deleterious substances.
- Dampen stones and lay on a full even bed of mortar with all joints filled and approximately 5mm wide. Use lead, slate or stainless steel distance pieces to ensure consistent joint width.
- 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. 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.

C45.160A EXTENT OF WORKS:

- Are as shown on coloured stonework repair schedules J22.056 AB10a-17a inclusively
  It must be noted that where indicative sizes and dimensions are given in schedules, they are for guidance only. Schedules must not be used as a cutting list.

C45.161A All masonry repairs to be undertaken in strict accordance with details indicated in English Heritage Practical Building Conservation: Stone (Ashford Press 2012). Copies available for viewing on request

C45.162A CONFIRMATION OF SCHEDULED WORK: Before commencing work shown on the schedules, allow to review the condition of elements of each elevation with the CA and agree final proposals before undertaking each drawing sheet wall section

C45.163A PHOTOGRAPHY: Where photographic recording is required by this section inspect the work with the CA and agree the nature and extent of photography. In addition to the requirements at clause 171A, allow to provide digital photographs of all final work elements per elevation Photographs are to cross referred to the As-built schedules.

C45.164A TOOLS: use tungsten tipped chisels and diamond dipped blades to provide clean cuts. Ensure all tools are kept sharp.

C45.165A INCLEMENT WEATHER:

- Do not use frozen materials and do not lay on frozen surfaces.
- Undertake work only when the temperature is 5^{o}C and rising and close and protect work before sunset.
- Protect new work from rain and snow by covering when precipitation occurs and at all times when the work is not proceeding.
- Protect new work from rapid drying out during hot weather, by covering and continual damping down.
- Maintain temperature of the work above freezing until mortar has fully hardened.
- Rake out and replace mortar damaged by frost or rapid drying out and where instructed, rebuild damaged work.

C45.166A PROTECTION:

- Prevent damage to stonework, particularly arrises and projecting features. Protect with wooden slats, boards etc., securely fixed. Remove at Practical Completion.
- Prevent staining and other disfigurement of stonework during works.
- Where scaffold canopies are not present, turn back scaffolding boards at night and during heavy rain to prevent splashing and staining.
- Where the roof or other structure is exposed due taking down and rebuilding or replacement ensure temporary protective coverings are provided see section B10.

C45.167A TEMPORARY SUPPORT AND ARRANGEMENT OF WORKS:

- Where a number of adjacent stones are scheduled for replacement, undertake the works ensuring that the stability of the structure over is maintained. Provide all necessary temporary supports.
- Provide method statements detailing the temporary support of jambs and heads of windows where jambs and sills are replaced.
- Where the replacement of complete or major sections of cornice stones is scheduled, carefully remove sufficient parapet stones to allow the works to be undertaken. Protect parapet stones removed and reinstall upon replacement of defective cornice stones.

C45.168A REMOVAL OF DEBRIS: Clear away debris as the work proceeds to skips and keep the work face and scaffold free of arisings. Ensure skips are removed as soon as they are filled and replacement skips provided. Do not stockpile debris in open heaps.

RAKING OUT AND REPOINTING
Repair code I

C45.252A CUTTING/RAKING OUT DEFECTIVE JOINTS:
- Use manual tools only, power tools are not permitted.
- Cut and rake out all defective mortar to a sound clean square backed face to a depth of at least 38mm or twice the joint height whichever is greater. Use a proprietary saw blade on fine joints.
- Where joints at this depth are found to be soft either deep tamp/pack or hand grout to fill sufficient for pointing to be undertaken.
- Prevent damage to surrounding stonework and in particular their arrises.
- Abate and lay dust by lightly spraying with water.
- Working from the top down thoroughly clean raked joints with a wooden implement/stiff bristle brush and flush out with clean water. Avoid unnecessary saturation.

C45.253A FILLING JOINTS: Joints exceeding 4mm wide.
- Hydraulic lime mortar mix as section Z21.
- Joints are to be thoroughly washed out and wetted, to reduce suction.
- Mortar is to be applied with a pointing iron in single layers, pressing the mortar hard ensuring a complete fill of the joint.
- Hydraulic lime will begin its initial set after 2-4 hours and one this has taken place the mortar must not be worked any further. Excess mortar must not be re-used/knocked up again and must be discarded. Any further coats of pointing should be applied within 1-2 days after the previous coat whilst the lower coat is drying out. This period will vary according to the season and climatic conditions. The pointing must be kept clean. Prevent from rapid drying out by spraying with water and the provision of temporary protection.

C45.254A FILLING JOINTS: Joints not exceeding 4mm wide.
- Hydraulic lime mortar mix as section Z21. Mortar for fine joints should be finely screened and passed under the edge of a trowel on a glass sheet or marble slab.
- Apply heavy-duty adhesive tape over the centre line of the cut-out joint, press firmly onto the stone surface. Using a sharp knife slit the tape and remove a strip the same width as the joint. Press edges of tape to seal against stone surface.
- Joints are to be thoroughly washed out with clean water using a syringe and wetted to reduce suction.
- Using a filling knife or other appropriate small tool press the mortar firmly ensuring a complete fill of the joint. Further packing of the mortar is to be carried out after removal of the tape.
- Hydraulic lime will begin its initial set after 2-4 hours and one this has taken place the mortar must not be worked any further. Excess mortar must not be re-used/knocked up again and must be discarded. Any further coats of pointing should be applied within 1-2 days after the previous coat whilst the lower coat is drying out. This period will vary according to the season and climatic conditions. The pointing must be kept clean. Prevent from rapid drying out by spraying with water and the provision of temporary protection.

C45.255A JOINT TREATMENT AND FINISH:

- The joint finish is to match the area of agreed trial pointing, typically it will be finished with a flat, rough surface flushed up to meet the surface of the adjoining stonework. After the initial set has taken place, having been taken back by the edge of a trowel, finish by stippling with a stiff bristle brush to reveal the aggregate
- Mortar joints are to follow the contours of the stones forming the context around them.

C45.256A PROTECTION AND AFTERCARE

- Provide all necessary protection to pointing areas and surrounding stonework.
- Protect new work from frost, rain and snow by covering when precipitation occurs and at all times when the work is not proceeding. It will be necessary to maintain protection in place for approximately 7-10 days.
- Protect new work from rapid drying out during hot weather, by covering and continual damping down. It will be necessary to maintain protection in place for approximately 7-10 days.
- Maintain temperature of the work above freezing until mortar has fully hardened.
- Rake out and replace mortar damaged by frost or rapid drying out and where instructed, rebuild damaged work.

FINAL CLEANING

C45.261A FINAL CLEANING DOWN: After completion of all repairs and immediately prior to striking the scaffold, thoroughly clean down all surfaces by brushing and water jetting to remove all dust and debris.

AS-BUILT SCHEDULES

C45.361A AS-BUILT SCHEDULES: Upon completion, the contractor is to provide the CA with 2No good quality copies of all colour schedules, corrected in colour using the agreed convention, to show the works undertaken. As-built schedules are to show the thickness of replacement/refaced stone and where appropriate fixing methods. Schedules are to be clearly marked `AS BUILT`.

Amendments to section C45				
Reference	Clause	Description	Date	By
B	Varies	Updated/corrected	**23.03.23**	**SCR**

C46 REPAIR AND CONSERVATION OF RANDOM STONEWORK

To be read with Preliminaries/ and General Conditions.

GENERAL

C46.100A HISTORIC SENSITIVITY OF THE BUILDINGS AND STRUCTURES: The Town Hall is a Listed Structure (Grade 2). It is to be treated with special consideration and care reflecting its historic importance, particularly in the selection of the workforce employed on the works.

C46.102A SUPERVISION: this significantly sensitive element of the works is to be under the close constant control of competent trade supervisors to ensure maintenance of satisfactory quality and progress.

C65.105A CRAFTSMAN: Cutting, dressing, laying, jointing and related works are to be undertaken by skilled masons.

C46.107A ARCHAEOLOGICAL ATTENDANCE: Allow access to the works by the Site Archaeologist employed directly by the client to undertake a watching brief for items of historic significance. Where the contractor finds items/areas which he considers may be of archaeological interest, he is to suspend his work in that area and advise the CA.

CONTROL TRIALS, REPAIRS AND SAMPLES

C46.111B CONTROL REPAIRS: Prior to commencement of the works contained in this section, undertake control repairs of each of those elements listed below at locations agreed with the CA. Modify repairs until a result is achieved to the satisfaction of the CA.
Control repairs are to include the following elements for:
- Mortar repair
- Piecing-in
- Re-facing stone
- Pining surface spalls
- Shelter coat grouting
- Re-pointing, the contractor is to allow for the provision of a pallet of up to six 1.0m lengths of re-pointing.

C46.112A ANALYSIS: See section C45.

C46.113A SAMPLES OF MATERIALS: Provide the CA with samples of the following for approval:-
- Random Forest of Dean stone for rebuilding etc. Stone samples are to be sufficiently large enough to show natural variations. Ensure delivered items match samples. See also control trial repair requirements clause 111A.
- See also section C45.

CONTRACTORS DESIGN

C46.121A CONTRACTORS DESIGN OF FIXINGS: Assume the responsibility for the assessment of loading, design and installation of pin and dowel fixings. This responsibility is notwithstanding any acceptance of design or details by the CA.

STONEWORK CHARACTERISTICS, SOURCING AND PROCUREMENT

C46.135A STONE CHARACTERISTICS: Stone is to be free from cleavage vents, cracks, fissures, discoloration affecting strength, durability or appearance. Thoroughly seasoned and sawn and machined where appropriate before delivery to site in accordance with cutting schedules, shop drawings and profiles supplied by the Contractor.

- Three or four differing characteristics are evident on original Hurdwick walling and a wide variety of colours, new elements are to match accordingly. Select bedding planes appropriate to the final position in the finished work and type of component and advise the supplier accordingly. There have been many problems historically which can now be observed due to the incorrect selection of bedding of the stone. Where possible correction of bedding planes is to take precedence over colour/stone characteristic matching.

C46.136A BED IDENTIFICATION OF QUARRIED STONE: Clearly mark each block to indicate the natural bed, way up and position in the finished work.

SUNDRY ITEMS

C46.141A BITUMEN SOLUTION: to BS6949, type 1 of brushing consistency.

C46.142A REINFORCING MESH: Austenitic stainless steel grade 316L

C46.143A REINFORCING WIRE: Austenitic stainless steel wire grade 316L for pinning spalls and mortar repairs.

C46.144A REINFORCING PINS: Austenitic stainless steel grade 316L 6mm diameter, ribbed or hammered for grip for stitching large spalls or fractures.

C46.145A REINFORCING PANELS, RODS AND PINS: Austenitic stainless steel grade 316L of sizes to contractor design as clause 121A.

C46.146A RESIN: to BS6319 DD88; for resin pinning.

C46.147A BIOCIDE: Iodopropynyl Butyl Carbamate, Cementone Beaver Ltd. Tel: 01280 823823 Microtech Masonry Biocide or other approved by the CA.

TRANSPORT, HANDLING AND STORAGE

C46.151A TRANSPORT AND HANDLING:
- Transport stone with least handling possible.
- Stack carefully on vehicle with adequate packing and spacers.
- Move and handle stones for reinstatement/replacement, loading, unloading and lowering or hoisting into position by adopting such necessary methods to prevent damage to stones.

C46.152A STORAGE:
- Store clear of ground to prevent leaking in of ground salts and/or moisture staining.
- Protect from frost in winter.
- Use spacers to allow the free air flow between stones.
- Prevent saturation from rain by the provision of adequate coverings.

WORKMANSHIP GENERALLY

C46.160A GENERALLY:
- Store stone clear of the ground, protect from inclement weather and keep dry. Prevent soiling, chipping and contamination by salts and other deleterious substances.
- Dampen stones and lay on a full even bed of mortar with all joints filled and approximately 5mm wide. Use lead, slate or stainless steel distance pieces to ensure consistent joint width.
- 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. 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.

C46.161A EXTENT OF WORKS:
- Taking down and re-building internal stonework to facilitate refurbishment works
- It must be noted that where indicative sizes and dimensions are given in schedules they are for guidance only. Schedules must not be used as a cutting list. Dimensions of scheduled stones are shown using the convention:- length x thickness x height.

C46.162A CONFIRMATION OF SCHEDULED WORK: Before commencing work shown on the Schedules and detailed drawings, allow to review the condition of elements of each elevation with the CA.

C46.163A PHOTOGRAPHY: Where photographic recording is required by this section inspect the work with the CA and agree the nature and extent of photography. See also section C45.

C46.164A TOOLS: use tungsten tipped chisels and diamond dipped blades to provide clean cuts. Ensure all tools are kept sharp.

C46.165A INCLEMENT WEATHER:
- Do not use frozen materials and do not lay on frozen surfaces.
- Undertake work only when the temperature is 5^{o}C and rising and close and protect work before sunset.
- Protect new work from rain and snow by covering when precipitation occurs and at all times when the work is not proceeding.
- Protect new work from rapid drying out during hot weather, by covering and continual damping down.
- Maintain temperature of the work above freezing until mortar has fully hardened.
- Rake out and replace mortar damaged by frost or rapid drying out and where instructed, rebuild damaged work.

C46.166A PROTECTION:
- Prevent damage to stonework, particularly arrises and projecting features. Protect with wooden slats, boards etc., securely fixed. Remove at Practical Completion.
- Prevent staining and other disfigurement of stonework during works.
- Where scaffold canopies are not present, turn back scaffolding boards at night and during heavy rain to prevent splashing and staining.
- Where the roof or other structure is exposed due taking down and rebuilding or replacement ensure temporary protective coverings are provided see section B10.

C46.167A TEMPORARY SUPPORT AND ARRANGEMENT OF WORKS: Where a number of adjacent stones are scheduled for replacement, undertake the works ensuring that the stability of the structure over is maintained. Provide all necessary temporary supports.

C46.168A REMOVAL OF DEBRIS: Clear away debris as the work proceeds to skips and keep the work face and scaffold free of arisings. Ensure skips are removed as soon as they are filled and replacement skips provided. Do not stockpile debris in open heaps.

C46.169B All masonry repairs to be undertaken in strict accordance with details indicated in English Heritage Practical Building Conservation: Stone (Ashford Press 2012). Copies available for viewing on request

C46.170B CONFIRMATION OF SCHEDULED WORK: Before commencing work shown on the schedules, allow to review the condition of elements of each elevation with the CA and agree final proposals before undertaking each drawing sheet wall section

TAKING DOWN AND REBUILDING SECTIONS OF MASONRY AND REBUILDING
Repair code A

C46.171A RECORDING:
- Inspect the work with the CA to confirm the nature and extent of operation.
- Photographically record all stones to be removed and their relationship to surrounding work. Label the stone and record references on the schedules using a system agreed with the CA.
- Note the stone sizes, bond, joint size, style and texture of pointing or any special or unusual features including tooling for replication.

C46.172A RELEASING STONES - SETTING ASIDE
- Release stones by cutting out joint material, cutting through anchors, fixings and the like and easing/levering stones form their backings, adopting such methods necessary to prevent damage to stones being removed and surrounding work.
- Abate dust by light spraying of water.
- Number individual stones on their underside as they are released or other location concealed in the final construction. Cross reference the numbering to photographs and repair schedules.
- Wash off stones with clean water and scrub off dirt.
- Carefully set stones aside on the working platform or lower to ground and store as agreed with the CA.
- Store as clause 152A.

C456.173A ASSOCIATED REPAIRS:
- Undertake repairs to individual stones as scheduled or detailed.
  Carefully remove cast iron components and undertake treatment and repairs

C4.174A REMAINING WORKS:
- Prevent saturation of the open wall and exposed structure by provision of adequate temporary coverings.

C46.175A RELAYING STONES IN THEIR ORIGINAL LOCATION:
- Treat open core void with biocide, clause 147.
- Provide the mason with copies of all numbered schedules and photographs for accurate resetting of stones in their original location.
- Clean and flush out with clean water to remove loose material and dust and reduce suction.
- Provide and insert stainless steel ties and dowels to replace originals.
- Dampen stones to be reset.
- Provide slate or lead spacers to gauge original joint widths and tamp stones into place on a full and even bed of mortar.
- Pack remaining joint with mortar using a rammer and pointing key
- Rake joints to a depth of 38mm as work proceeds for mortar pointing.

C46.176A POINTING: Undertake pointing as clause 253A-256A inclusive.

CUTTING OUT DEFECTIVE STONEWORK FOR REPLACEMENT, REFACING, PIECING-IN AND MORTAR REPAIR
Repair code B

C46.181A RECORDING:
- Inspect the work with the CA to confirm the nature and extent of operation.
- Photographically record stonework to be cut out.

C46.182A CUTTING OUT COMPLETE STONES:
- Undertake cutting out with extreme care to prevent damage to adjacent stones.
- Carefully cut out perimeter joints using a plugging chisel or in the case of fine joints a proprietary fine saw blade. Do not use power tools for cutting out joints.
- Carefully cut out stone starting from centre and working outwards adopting such methods necessary to prevent damage to adjacent surrounding stonework.
- Do not use aggressive percussion drilling techniques where this is likely to cause opening-up of adjacent fractured stones.

C46.183A CUTTING OUT FOR REFACING:
- Undertake cutting out with extreme care to prevent damage to adjacent stones.
- Carefully cut out perimeter joints using a plugging chisel or in the case of fine joints a proprietary fine saw blade. Do not use power tools for cutting out joints.
- Carefully cut out stone starting from centre and working outwards adopting such methods necessary to prevent damage to adjacent surrounding stonework.
- Do not use aggressive percussion drilling techniques where this is likely to cause opening-up of adjacent fractured stones.
- Cut out to depth as scheduled and square up remaining face.
- Form undercut to stonework over intended re-facing as scheduled and agreed with CA.
- Carefully drill small exploratory pilot holes through remaining stone and establish thickness of remaining stone. Where less than 75mm remains consult CA before proceeding.

C46.184A CUTTING OUT FOR PIECING-IN/MORTAR REPAIR:
- Undertake cutting out with extreme care to prevent damage to adjacent stones.
- The use of power tools is permitted providing they are used with extreme care to prevent damage to adjacent stone. Aggressive drilling using percussion techniques must not be used; see also clause 162A.
- Carefully cut out defective stone to the minimum size providing an undercut profile for mortar repairs. Do not square up the face of small holes for mortar repair.

REMOVAL OF EMBEDDED METAL
Repair code C

C46.185A RECORDING: Photographically record the metal component before removal.

C46.186A REMOVAL OF EMBEDDED METAL:
- Undertake cutting out with extreme care to prevent damage to adjacent stones.
- The use of power tools is permitted providing they are used with extreme care to prevent damage to adjacent stone. Aggressive drilling using percussion techniques must not be used; see also clause 162A.
- Carefully remove embedded metal and hard cement bedding/pointing by stitch/chain drilling around the object. Take extreme care where object is to be retained for treatment and refixing not to damage the component.
- Keep cutting out to the minimum size. Square up large holes to provide rectangular edges of undercut profile for mortar repairs. Leave small holes irregular in elevation. Where corrosion of embedded metalwork has caused iron staining on stonework below the item inform the CA and await his instruction on the method of stain removal.

REPLACEMENT OF WHOLE STONES, PIECING-IN AND REFACING OF STONE
Repair code D

C46.191A BEDDING: Do not bed stones in resin.

C46.192A PROCEDURE:

- Select a matching stone as close as possible to the original colour, grain, shell and other characteristics. The pieces must be geologically compatible with the host stones and placed in the correct bed. The bed of the existing stone may not necessarily be correct.
- Prepare stone to required size, offer up to the wall and scribe around. Cut out as clauses 182A, 183A or 184A.
- Where refacing stone, drill the back of the stone for fixing pins/dowels to contractors design clause 121A,
  form suitable templates and record position of holes. Wash out holes to remove all slurry and debris.
- Fill drill holes with epoxy resin to a level so that excess resin does not exude out of the hole. Lay the template over the stone and insert the pin/dowel; leave the template in position to hold the pins true. Use resin with care. Do not get resin on the face of the stone.
- When the resin is dry, coat the ends of the pin/dowel to enable corresponding marks to be made on the host stone. Drill out the holes to required depth.
- Offer up the piecing-in/facing and check alignment.
- Undertake final trimming and sharpening of the arrises.
- Thoroughly soak the piece in clean water, wet up the joint and surrounding faces, temporarily plug pin/dowel holes to prevent wetting.
- Slurry coat the socket and meeting faces with hydraulic lime. Do not bed stones in resin.
- Fully fill drill holes with resin and offer the stone into position. Remove any excess slurry.
- After adequate drying period, deep mortar pack and point around refaced stone. Apply mortar repair around pieced-in stone as specified in this section.
- Tool faces of stone to match that of the host or adjacent stones and original details as undertaken on the recently completed Brewhouse contract.

REMOVAL OF MORTAR/RENDER/PLASTER
Repair code E

C46.202A REMOVAL:

- Carefully remove hard cement mortar, render and plaster coatings and formed pads on faces of stonework using hand tools.
- Lightly dress the face of the stone to remove all traces of coating and tool to match surrounding stone.
- Where coating has penetrated hollows and voids, inform the CA and where instructed carefully cut out hard material.
- Depending upon the extent of cutting-out mortar repair/piece-in as instructed by the CA.

MORTAR REPAIR OF STONE
Repair code F

C46.211A LIMIT OF REPAIR: Mortar repairs are to be limited to small areas only particularly on Hurdwick masonry. Where final prepared holes exceed those noted on schedules, inform the CA prior to proceeding with the repair.

C46.212A CUTTING OUT: cut out and prepare as clause 184A.

C46.213A PREPARATION: flush cavity with water and sterilise with formalin.

C46.214A PINS: for cavities over 50mm deep and over 0.01m^2 in surface area

- Drill and fix 3mm dia ribbed stainless steel wire pins spaced at 50mm maximum centres.
- Flush out holes with 50/50 water/alcohol solution
- Set pins into holes in epoxy resin so that a minimum 20mm cover is provided.

C46.215A MORTAR REPAIR:

- Wash out and wet the hole. Fill with matching stone fragments bedded in pointing mix and bring to line 15mm below surface of finished stone.
- Build to line in two coats of mortar repair mix and leave proud of surface, take care not to coat the face of stones. Ensure base coat is fully dry before applying the second coat, key first layer.
- When green hard, cut back and texture surface using a wooden stick or felt covered cloth. Do not use steel floats or absorbent pads.
- Adjust colour to suit surrounding stone by toning up or down with coal ash or charcoal fines.
- Cover with damp hessian and allow to cure, keeping damped down as necessary.

PINNING OF SURFACE SPALLS AND CRACKS IN MASONRY
Repair code G

C46.222A FIXING DESIGN: See clause 121A.

C46.223A PINNING OF STONE FACE:
- Agree location of pinning positions with the CA.
- Carefully drill pilot hole and gradually enlarge to required diameter, hole should run across the fracture at a downward angle of approximately 10^{o} to the horizontal.
- Flush out hole with a 50/50 water/alcohol solution using a syringe. Ensure that all debris and dust is removed. Allow to dry thoroughly.
- Temporarily seal all joints that are likely to leak resin with clay and fill the hole full with epoxy resin using a syringe ensuring that excess resin does not exude from the hole. In deep holes use a straw to ensure that no air is trapped.
- Carefully insert stainless steel threaded dowel ensuring that resin does not overflow from hole.
- Once the resin has set point the holes with repair mortar mix and patinate if required as specified in this section.
- Grout/shelter coat grout as scheduled and specified in this section.
- Fill remaining open surface joint/crack with mortar repair.

SHELTER COAT GROUT (PLASTIC)
Repair code H

C46.241 **All works and materials in strict accordance with Saint Astier Ty-Mawr St. One guidance**.

C46.242A EXTENT OF TREATMENT: Although whole face areas of Hurdwick stone are likely to be treated, it is the intention to work the medium into fissures, not to surface paint the stone.

C46.243A SURFACE PREPARATION: Lightly finger scabble and brush the face of stones to remove all loose and friable material back to sound stone.

C46.244A SHELTER COAT GROUTING:
- Where practical apply heavy duty adhesive tape over the line of the fissure and using a sharp knife remove a strip the same width as the fissure. Press down edges of tape.
- Flush out fissures with a 50/50 solution of water/alcohol and allow to dry. Apply Lithomix shelter coat mix at section Z21 by brush working deeply into the fissures only, do not paint the whole stone surface.
- Remove tape and wipe away excess coating from stone face. Allow to dry and rub the face back thoroughly with hessian to the adjoining stone.

FINAL CLEANING

C46.302A FINAL CLEANING DOWN: After completion of all repairs and immediately prior to striking the scaffold, thoroughly clean down all surfaces by brushing and water jetting to remove all dust and debris.

Amendments to section C46				
Reference	Clause	Description	Date	By
B	Varies	Updated/corrected	**23.03.23**	**SCR**

C51 REPAIR/RENOVATING TIMBER

To be read with Preliminaries/ and General Conditions.

GENERAL

TYPES OF TIMBER

C51.100A HISTORIC SENSITIVITY OF THE BUILDING: The building is Grade 2 Listed and is to be treated with special consideration and care reflecting its historic importance.

C51.202A TIMBER FROM SUSTAINABLE SOURCES: Timber and timber-based products are to be from sustainable and renewable sources. Prior to procurement, the contractor is to submit to the CA a statement detailing the means of certifying compliance with an internationally recognised scheme.
Acceptable forms of accreditation include: -

- Suppliers registered with the Timber Trade Federation `Environmental Purchasing Policy scheme`.
- Timbers produced and harvested in accordance with principles of good forest management and evaluated, accredited and monitored under the Forest Stewardship Council scheme and displaying the Forest Stewardship Council (FSC) mark.
- Purchased timbers are to be “legal timber” as defined in current edition of UK Government Timber procurement policy.

C51.205A 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 100mm 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 sections to be regarded to approval and marked accordingly.

C51.212Ab BULK SOFTWOOD TIMBERS For replacement roof timbers. Rotten valley rafter, wallplate and common raters discovered to be rotten

- Species: Douglas Fir as specified.
  Salvaged timber will be considered subject to approval of samples by the CA.
- Timbers from the same source must be used in complete room/areas.
- Finish: sawn.
- Moisture content at time of erection: Maximum 18%
- Samples: see clause 201
- Procurement: As soon as the CA has given approval to samples obtain timbers for the entire project.
- Locations:
- 225x50mm Valley rafter approx. 500mm in length
- 50x75mm common rafter (sister repair 500mm in length). 5 No. location (to be agreed finally on site with CA)
- 150x100mm wallplate 1000mm in length

WORKMANSHIP GENERALLY

C51.401A BASIC WORKMANSHIP: Comply with the clauses of BS8000: Part 5 which are relevant to this section.

C51.403A ACCURACY: Not withstanding BS8000: Part 5, clause 3.2.1, comply with Preliminaries clause A33/340 and any required critical dimensions given in the Specification or on the drawings.

C51.404A LIMITS OF DEFECTS AND SELECTION: In the process of assembly and construction select the graded timber so that no defect permitted by such grading prejudices the strength of the completed structure at bearings, joints and other assemblies. In particular, no wane, knotholes or fissures are permitted which would prejudice such assemblies and no wane is permitted which would prejudice such fixings.
Generally, the whole of the timber shall be well cut, bright, sound and square-edged, thoroughly seasoned and free from warp, sap, rot, shakes, loose or dead knots, wavy edges, worm or beetle or other imperfections to such an extent or so situated in the piece as to render it insufficient in strength or stiffness for the work to be executed.
Timber which in the judgment of the CA does not conform to these requirements or is inferior in quality and condition or is not suitable for the requirements of the work shall be replaced at the Contractor's expense.
The timber may be kiln or air seasoned but shall be free from seasoning defects such as case hardening, brittleness etc when delivered to site.

C51.405A 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 BS4471 for softwoods and BS5450 for hardwoods.
- Timbers are to be of finished sizes to match host timbers where scarf repaired or adjacent members where components are completely replaced.

C51.406A REDUCTION TO FINISHED SIZES of planed/regularized timber to be to BS4471 for softwoods and BS5450 for hardwoods.

C51.407A SELECTION AND USE OF TIMBER:
- Do not use timber members that 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.

C51.408A PROCESSING TREATED TIMBER:
- Carry out as much cutting and machining as possible before treatment.
- Retreat all treated timber that 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.

C51.408A TREATED TIMBER: Treat surfaces exposed by minor cutting and drilled with two flood coats of a solution recommended for the purpose by main treatment solution manufacturer.

C51.409A MOISTURE CONTENT of timber at time of erection to be not more than 18%.

C51.410A PROTECTION:
- Keep timber dry and do not over-stress, distort or disfigure sections or components during transit, storage, lifting, erection or fixing.
- Store timber and components undercover, 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.

C51.411A EXPOSED TIMBER: Prevent damage to and marking of surfaces and arrises of planed structural timber which will be exposed to view in completed work.

JOINTING TIMBER

C51.601A JOINTING/FIXING GENERALLY: Where not specified otherwise, select fixing and jointing methods and types, sizes and spacings of fastenings in compliance with relevant British Standards.

C51.602A BOLTED JOINTS:
- Locate holes accurately and drill to diameters as close as practical to the nominal bolt diameter and not more than 2mm larger.
- Place washers under all bolt heads and nuts that bear directly on timber. Use spring washers in locations that 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, INSTALLATION AND JOINTING

C51.702A SAMPLE/CONTROL JOINTS: Allow for the first joint of each type to act as a sample for approval by the CA. Modify the work and replace components until the joint meets the satisfaction of the CA. Maintain access to the sample for control of subsequent joints.

C51.704A JOINTING AND REPAIR OF EXISTING TIMBERS:
- Carefully remove existing boarding, rafter, purlins, supports or other components to the minimum amount necessary to undertake the repair. Provide all temporary propping and support, see clause 301.
- Where timbers sit on stone bearings or in formed pockets inspect these with the CA and agree any consolidation or pointing of the stonework before commencing the repair.
- Where roof joists are replaced form halved joints over purlins.
- Joint timbers by a method agreed with the CA.
- Carefully cut out existing timbers the minimum amount necessary. Where timbers are deteriorated beyond the point of scheduled repair advise the CA and await his instructions.
- Select timbers for the repair with characteristics to match the host timber and of sufficient cross section to account for any deformation of the original member. Do not use timbers with shakes, splits, large knots or other defects.
- Cut all joints square to line and plane, dismantling and adjusting the meeting surfaces by paring away as necessary so that closely butted joints are formed. Do not use fillers in joints.
- Ensure that new timbers are cut and trimmed to old including any deformation of the existing member, see clause 201.
- Ensure that bolted connections through scarf repaired timbers run perpendicular to and centrally through the face of the component. Cut housings, slots and mortises so that plates are recessed and nuts/bolt projections sit flush with the timber surface.
- Where detailed or specified cut folding wedges from the same timber used for the repair. Leave final driving and cutting off projecting sections of folding wedges until the loading of the component has been re-applied and until the last possible time before any access scaffold is struck.
- Insert lead dpc`s and provide ventilation gaps or cloaks as detailed, see section H71.
- Clear dust and debris from all areas.
- Do not allow glues or resins come in contact with the surface of timbers.

Amendments to section C51				
Reference	Clause	Description	Date	By

C53 REMOVAL OF VEGETATION AND TREATMENT

To be read with Preliminaries/ General Conditions.

GENERAL

C53.050A HISTORIC SENSITIVITY OF THE BUILDING AND STRUCTURES: The building is Grade 2 Listed and is to be treated with special consideration and care reflecting its historic importance.

C53.104A USE OF CHEMICALS: The use of chemicals specified in this section is to be kept to the absolute minimum.

C53.105A EXTENTS Mayors parlour/office north and south east roof slopes

SAFETY, PROTECTION, CLEANLINESS AND DISPOSAL

C53.121A SAFETY:
- Chemicals must be approved under The Control of Pesticides Regulations 1986 and have a Health and Safety Executive (HSE) approved number.
- Handle, store and dispose of chemicals in accordance with the pesticides safety precautions scheme, the Health and Safety Executive's recommendations and particular manufacturers instructions.
- Wear protective overalls gloves, safety goggles and protective respiratory mask at all times when mixing, handling and applying chemicals.
- Do not spray in the vicinity of unprotected people and animals.
- Do not spray in windy conditions where drift would carry the spray beyond the intended areas.
- Do not spray near water courses.

C53.122A INCLEMENT WEATHER:
- Undertake any cleaning work only when the temperature is 5^{o}C and rising and close and protect work before sunset.

C53.123A PROTECTION:
- Provide all necessary protection to areas to be treated and surrounding works.
- Protect areas below and adjoining the works by covering with polythene sheet.
- Do not allow chemical paste to come into contact with masonry surfaces.

C53.124A PREPARATIONS: only prepare sufficient quantities of solutions and pastes for use in the same day at one time.

C53.125A CLEANLINESS AND DISPOSAL: Remove all treated vegetation, debris, protection and hazardous materials and their containers regularly for disposal off site in a safe and competent manner to a licensed disposal centre.

MATERIALS

C53.131A SAFETY: chemicals used must be under The Control of Pesticides Regulations 1986 and have a Health and Safety Executive (HSE) approved number.

C53.133A BIOCIDE: Iodopropynyl Butyl Carbamate, Cementone Beaver Ltd .Tel: 01280 823823, Microtech Masonry Biocide or other approved by the PM.

C53.134A PASTE: Zinc Octade Paste, Cementone Beaver Ltd. Tel: 01280 823823, Wykamol Green Range timber treatment paste or other approved by the Architect.

TREATMENT OF IVY, CREEPERS AND WOODY PLANTS

C53.141A METHOD OF TREATMENT AND REMOVAL:

- Cut out and remove a length of the main stem approximately 300mm above ground level or 150mm away from the point of rooting into the stonework.
- Brush apply biocide at clause 133A diluted with water to manufacturers recommendations and leave to die.
- Leave for ten days.
- Cut a frill girdle around the parent stem and coat all the exposed surfaces with a paste at clause 134A. Wrap the cut stem and treated area securely with a plastic covering. Take extreme care not to allow the paste to contact masonry surfaces.
- Allow a period of approximately ten days before cutting and removing the plant carefully in sections from the masonry surface and all joints.
- Roots in the wall must be cut-out, all woody pieces removed. and joints deep mortar tamped and pointed as specified in section C46.
- To areas agreed with the CA, as section C46, carefully remove stones sufficient to allow the removal of embedded roots and woody growth and deep mortar pack voids and reinstate stones.

TREATMENT OF ALGAL SLIMES, LICHENS, MOSSES AND SMALL HERBACEOUS PLANTS

C53.151A METHOD OF TREATMENT AND REMOVAL
INITIAL TREATMENT:

- Remove as much growth as possible in the form of plants and thick cushions of moss, using knife blades, spatulas and stiff bristle or non-ferrous soft wire brushes.
- Prepare a solution of biocide at clause 133A diluted with water to manufacturers recommendations.
- Apply the biocide solution using a masonry paint brush or , start at the top of the vertical surface to be treated and move across horizontally and slowly, to allow approximately 100mm run down. The following pass should be made across the previous run-down,
- Leave the treated area for at least one week. Brush off as much dead growth as possible with bristle brushes.
- Prepare a second solution of biocide at clause 133A and apply as noted above for the initial treatment.
- Allow the surface to absorb and carry out a second application as growth inhibitor.

Amendments to section C53				
Reference	Clause	Description	Date	By

G20 CARPENTRY/ TIMBER FRAMING/ FIRST FIXING

To be read with Preliminaries/ General Conditions

GENERAL

G20.100A REMOVAL OF EXISTING ROOF COMPONENTS
- Location/ Components: Roof valley joist components where existing roof is to be repaired as well as where new lead covered gutters are to be re-built.

G20.101A TIMBER FROM SUSTAINABLE SOURCES: Timber and timber-based products are to be from sustainable and renewable sources. Prior to procurement, the contractor is to submit to the CA a statement detailing the means of certifying compliance with an internationally recognised scheme.
Acceptable forms of accreditation include: -
- Suppliers registered with the Timber Trade Federation `Environmental Purchasing Policy scheme.
- Timbers produced and harvested in accordance with principles of good forest management and evaluated, accredited and monitored under the Forest Stewardship Council scheme and displaying the Forest Stewardship Council (FSC) mark.

G20.150 STRENGTH GRADING OF TIMBER
- Grader: Any company currently registered under a third party quality assurance scheme operated by a certification body approved by the UK Timber Grading Committee.

G20.160 GRADING AND MARKING OF SOFTWOOD
- Timber of a target/ finished thickness less than 100 mm and not specified for wet exposure: 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 installation at higher moisture contents: Clearly marked as ‘WET’ or ‘GRN’.
- Structural timber members cut from large graded sections: Regraded to approval and marked accordingly.

PRODUCTS

G20.211 GENERAL SPECIES LOCATIONS
Replacement softwood used in internal or hidden locations: graded softwood or CA equivalent approved.
Replacement softwood used in external exposed locations: Douglas Fir or CA equivalent approved.

G20.210 STRUCTURAL SOFTWOOD (GRADED DIRECT TO STRENGTH CLASS) FOR NEW GUTTER CARCASSING
- Grading standard: To BS 4978 or BS EN 519 or other national equivalent and so marked.
- Strength class to BS EN 338: C24
- Treatment: CCA/60.
- Components: Joists, wallplates and studs.
- Preservative treatment: CCA as section Z12 and British Wood Preserving and Damp Proofing Association Commodity Specification C8.
- Sizes 100x50mm and as may be required on site.(as agreed with CA on site).
- Construct carcassing to provide min 225mm clear width lead gutters falling at min 1:60. 55mm drips between each length (max 2250mm). Provide edge rebates to drip high points to allow for lead covering thickness (See LSA Fig 213)

WORKMANSHIP GENERALLY

G20.401 CROSS SECTION DIMENSIONS OF STRUCTURAL SOFTWOOD
- Dimensions: Dimensions in this specification and shown on drawings are target sizes as defined in BS EN 336.
- Tolerances: The tolerance indicators (T1) and (T2) specify the maximum permitted deviations from target sizes as stated in BS EN 336, clause 4.3:
- Tolerance class 1 (T1) for sawn surfaces.
- Tolerance class 2 (T2) for further processed surfaces.

G20.402 CROSS SECTION DIMENSIONS OF NONSTRUCTURAL SOFTWOOD
- Dimensions: Dimensions in this specification and shown on drawings are finished sizes.
- Maximum permitted deviations from finished sizes: As stated in BS EN 1313-1:
- Clause 6 for sawn sections.
- Clause NA.2 for further processed sections.

G20.420 WARPING OF TIMBER
- Bow, spring, twist and cup: Not greater than the limits set down in BS 4978 or BS EN 519 for softwood, or BS 5756 for hardwood.

G20.430 SELECTION AND USE OF TIMBER
- Timber members damaged, crushed or split beyond the limits permitted by their grading: Do not use.
- Notches and holes: Position in relation to knots or other defects such that the strength of members will not be reduced.
- Scarf joints, finger joints and splice plates: Do not use without approval.

G20.440 PROCESSING TREATED TIMBER
- Cutting and machining: As much as possible before treatment.
- Extensively processed timber: Retreat timber sawn lengthways, thickness, planed, ploughed, etc.
- Surfaces exposed by minor cutting and/ or drilling: Treat with two flood coats of a solution recommended by main treatment solution manufacturer.

G20.450 MOISTURE CONTENT
- Moisture content of wood and wood based products at time of installation: Not more than:
- Covered in generally unheated spaces: 24%.
- Covered in generally heated spaces: 20%.
- Internal in continuously heated spaces: 20%.

G20.510 PROTECTION
- Generally: Keep timber dry and do not overstress, distort or disfigure sections or components during transit, storage, lifting, erection or fixing.
- Timber and components: Store 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.

G20.550 EXPOSED TIMBER
- Planed structural timber exposed to view in completed work: Prevent damage to and marking of surfaces and arrises.

JOINTING TIMBER

G20.570 JOINTING/ FIXING GENERALLY
- Generally: Where not specified precisely, select methods of jointing and fixing and types, sizes and spacing of fasteners in compliance with section Z20.

G20.600 BLACK BOLTS AND NUTS
- Standard: To BS EN ISO 898-1 and BS EN 20898-2.

G20.620 WASHERS
- Standard: Plain to BS 4320, spring to BS 4464.
- Material and finish: To match bolts.
- Dimensions when seated directly on timber surfaces: Unless specified otherwise:
- Diameter/ side length: Not less than 3 times bolt diameter.
- Thickness: Not less than 0.25 times bolt diameter.

G20.630 BOLTED JOINTS
- Bolt spacing (minimum): To BS 5268-2, table 81.
- Holes for bolts: Located accurately and drilled to diameters as close as practical to the nominal bolt diameter and not more than 2 mm larger.
- Washers: Placed under bolt heads and nuts that would otherwise bear directly on timber. Use spring washers in locations which will be hidden or inaccessible in the completed building.
- Bolt tightening: So that washers just bite the surface of the timber. Ensure that at least one complete thread protrudes from the nut.
- Checking: At agreed regular intervals up to Completion. Tighten as necessary.

G20.670 ANTICORROSION FINISHES FOR FASTENERS
- Galvanizing: To BS 7371-6, with internal threads tapped and lightly oiled following treatment.
- Sherardizing: To BS 7371-8, Class 1.
- Zinc plating: To BS EN ISO 4042 and passivated.

ERECTION AND INSTALLATION

G20.676A VALLEY GUTTER FRAMING
- Fix sawn treated softwood plates, battens and blocking to rafters using stainless steel screw fixings as detailed. Fix plates, bearers, props, battens and the like as detailed.

G20.677A EAVES TILTING FILLETS:
- 100x25mm finished treated sawn softwood tilting fillet fixed using stainless steel nails.

G20.760 TEMPORARY BRACING
-Provision: As necessary to maintain structural timber components in position and to ensure complete stability during construction.

G20.770 ADDITIONAL SUPPORTS
- Provision: Position and fix additional studs, noggings and/ or battens to support edges of sheet materials, and wall/ floor/ ceiling mounted appliances, fixtures, etc. shown on drawings.
- Material properties: Additional studs, noggings and battens to be of adequate size and have the same treatment, if any, as adjacent timber supports.

G20.795 TRIMMING OPENINGS
- Trimmers and trimming joists: When not specified otherwise, not less than 25 mm wider than general joists.

G20.851 PROTECTION OF EMBEDDED TIMBERS
- Cut out existing wallplate sections below removed floor joists.
- Protect all joists built into walls.
- Prior to lay a dpc to underside level in socket formed to wall.
- Ensure a min 25mm ventilation gap is maintained around sides and back of all embedded timbers.

Amendments to section G20				
Reference	Clause	Description	Date	By

H63 NAILED FIXED NATURAL SLATING

To be read with Preliminaries/General conditions

TYPE OF SLATING

H63.100A HISTORIC SENSITIVITY OF THE BUILDINGS AND STRUCTURES: The Town Hall is Grade 2 listed and is to be treated with special consideration and care reflecting its historic importance.

H63.110A ROOF SLATING:

- Lay as clause 240A, directly to new treated sawn 50x25mm softwood slating battens to BS 5534 set to correct gauges and headlap distances over common rafters. Fix with round shank zinc coated nails, 10 gauge 65mm long ensuring battens are true for horizontal and perpendicular slate courses. Nail to centre of battens with nails angled inwards for greater holding strength.
  Battens to span min of 3 No.rafters, min length 1200mm. Max moisture content 22% to battens. Discard any battens that have split due to nailing.
- Slate fixing: using 3.00 minimum dia copper clout headed nails to BS1202 pts 2 + 3 with a 10mm dia head, 38mm min length, 2nails per slate (centre nailed per slate).
  Nails and fixing to be in strict accordance with BS:5534:2014 and be 25mm from slate edge.
  Slates:
- Supplier: The Delabole Slate Company Ltd, Pengelly, Delabole,Cornwall,PL33 9AZ
- Size: to match existing
- Conforming to all the requirements of BSEN 12326-1and BS:680 including level conformity for the thermal cycle and sulphur dioxide tests (T1 and S1 respectively) and to the Quality Assurance Specification operated by the slate quarry.
  Thickness 5-8mm nominal.
- Surface characteristics: Variations in surface texture acceptable; no steps, cramps etc. that would affect the lie of the slate when fixed or have significant visual impact.
- Dimensions: All slates to be square, within dimensional tolerances and have all edges dressed. Corners broken within 15mm of any edge will be acceptable.
- Camber: Slate should be dressed in a manner to ensure a convex camber if the slate is laid on its bed. Slight twisting of the corners of the slate are permissible at the head of the slate.
- Slate and half for abutments, valley lines end of courses and the like. See also clause 212.
- Slates: Second hand to H63 clauses or natural newly extracted and formed from quarry.
- Standard: New slates to conform to all the requirements of BSEN12326-1 (and the tests in BSEN12326-2 amended 2003) and BS:680
  Fixing: As clause 276,
  Pitch minimum headlap 75-100mm
  See also clause 212.
- Slates to be laid in sized slate coursing not in diminishing courses.

SLATING GENERALLY

H63.210a BASIC WORKMANSHIP:

- Comply with the requirements of BS 5534 2014 and BS 8000 Part 6 1990. Keep slates clean 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.

H63.211A Prior to stripping slates undertake a thorough search of the roof spaces for hibernating or returning bats and consult the CA immediately if any are found.

- Carefully remove existing scheduled slating and ridge tiles avoiding damage. Gently clean off existing bedding and pointing mortar to ridges. Set aside all ridge tiles for reuse and stack vertically in a safe secure area.
- Set aside all slates to Ground for re-sale by the client.

H63.212A CHECKING ROOF PITCHES AND CONFIRMATION OF SLATE SIZES:

Pitch angles shown on the plans are approximate for guidance only. At the commencement of the contract, as soon as safe access is available to roof areas, the slate roofing contractor is to accurately survey all roof pitches. The slate roofing contractor is to calculate any required increase in the minimum lap or advise the need for differing size slate to meet the requirements for severe exposure rating. Submit details of calculations and proposals to the CA for approval.

H63.213A CONTROL SLATING:

- Allow to undertake initial areas of slating at the eaves and ridge abutments as control for the remaining work. Lay slates to small areas at each location as agreed with the CA. Invite the CA to inspect the work and seek approval before continuing. Allow to modify the slating until a result is achieved to the satisfaction of the CA.

H63.274A SLATE HOLING AND GRADING/SORTING:

- Set up a test table as agreed with the CA for checking of slates. It should be noted that twisted and bent slates should not be immediately discarded as they are useful for undulations in old roofs.
- Undertake an initial inspection as soon as possible following delivery to site. At ground level, sort slates from delivery crates into thickness grades. Grade to heavy, medium and lightweights for coursing on the roof. Further select slates while laying to ensure that the slates in any one course are of the same thickness to prevent kicking-up and large gaps at the tail.
- Hole slates during the sorting process ensuring the thicker end becomes the tail.
- Hole each slate twice as close to as practicable to the edge, approximately 20-25mm to the centre line of the hole. Holes are to be placed so that nails will just clear the head of the slate below.
- Holing is to be formed from the bed-side using a rotary drill or holing machine. Ensure the holes are not too tight and that a rough countersink is formed. Individual slates may be holed by pecking-out ensuring holes are correctly aligned.

H63.276A SLATE FIXING:

- Lay with an even overall appearance with slightly open butt joints and tails of slates aligned. As far as possible sort slate for thickness across the roof slope.
- Carefully select and use slates of consistent thickness in any one course laid with thicker end as tail.
- Use extra wide slates at ends of courses and raking cuts 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 BS1202: Part 2, for 37mm thick sarking boards through countersunk holes 20-25mm from side edges. Fix slates wider than width and a third with three nails.
- Shoulder the head of slates as necessary to aid with laying.
- At sprocketed changes of pitch (i.e. eaves tilt), increase length of nails as necessary to ensure full penetration of the sarking.
- Slates are to be fixed in strict accordance with BS:5534 and BS:8000.

ROOF SLATING EDGES/JUNCTIONS/FEATURES

H63.305 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.
- Shouldering of slates and the use of nail on edge packing to achieve evenly laid slates is

permitted.

- Fix edge slates and fittings securely to neat, true lines.
- Ensure that all flashings (supplied by other trade package contractors, specified in another section) are fixed with or immediately after the slating, and are neatly dressed down.

H63.346A EAVES:

- Fix slates with tails projecting 50mm minimum forward of fillet to a raking cut line ensuring good run off of rainwater into all guttering

H63.456A ABUTMENTS

- Cut slates as necessary and interleave with lead soakers to form a close, weathertight abutment.
- Fix soakers by turning down over the head of each slate.
- Ensure that lead flashings are neatly dressed down over soakers immediately after slating is complete.

H63.781A JUNCTIONS:

- Lead soakers cut to shape supplied by the Leadwork package contractor.
- Interleave lead soakers lapped 150mm with the slate to provide a weathertight seal at the eaves sprocket change.

PROTECTION OF COMPLETED ROOF AREAS

H63.910A PROTECT completed roof areas from damage by following trades: -
Access over unprotected roof areas is not permitted under any circumstances.

Amendments to section H63				
Reference	Clause	Description	Date	By

H71 LEAD SHEET COVERINGS/FLASHINGS

H71.100A HISTORIC SENSITIVITY OF THE BUILDING: The building is Grade 2 Listed and is to be treated with special consideration and care reflecting its historic importance.

TYPES OF LEADWORK

H71.211A PARAPET GUTTERS:
- See roof drawing AD01 for all locations.
- Base: open jointed regularised sawn square edge boarding 25mm thick.
- Underlays: Johns Manville (formerly Monomet Limited, Trevira Spunbond) Geotextile type 011/20.
- Type of lead: Milled as clause 550, code 6.
- Hand evidence of black code tapes to designate correct code to CA during works.
- Cross joints: Drips, 55mm
- For codes, lengths of gutter bays, drips, falls and ventilation: refer to current LSA handbook.
- Underside slurry treated as clause H71.591A
- Max gutter length between drips 2250mm, min width over carcassing 225mm.
- Upstand: not less than 100mm

H71.314A ROOF ABUTMENT COVER FLASHINGS:
- Location: Existing main slate covered roof slopes at abutments with masonry over retained but to be made redundant secret gutters.
- See roof drawing for all locations.
- Cover flashings:
  Milled lead code 5 in lengths not exceeding 1500mm.
- Hand evidence of blue code tapes to designate correct code to CA during works.
  End to end joints: Laps of not less than 150mm.
  Cover: Overlap to retained slates/secret gutters not less than 150mm.
  Fixing: The upper edge of the leadwork is to be turned into stonework chase and fixed. Retain lower edge with lead welded lead clips at 300mm centres.
- Underside slurry treated as clause H71.591A
-

H71.315A LEAD LINED CATCHPITS:
- Layout drawing references: AD/01
- Underlays: Johns Manville (formerly Monomet Limited, Trevira Spunbond) Geotextile type 011/20 with applied chalk treatment..
- Base: new softwood sarking forming square dimensions.
- Type of lead: milled as clause 550, code 6 formed on the bench, cut folded and fully leadwelded.

H71.316A SOAKERS,FLASHINGS
- Abutment flashings:Lead: milled code 5.
- Dimensions:
- not less than 150mm underlap to each side flashing
- Upstand: Not less than 75mm
- Cover to roof: Not less than the lap of the slate.
- Fixing: Machine cut a chase and fix as LSA details
- Soakers:
- Lead: Code 4 cut and dressed to shape for fixing by slater.
- Dimensions:
- Length: Slate gauge + lap + 25mm
- Upstand: not less than 75mm
- Underlap: Not less than 100mm

H71.321A LEAD PROTECTION OF TIMBERS BEARING IN EXTERNAL WALLS:
- Use Code 5 lead dpc of size 5mm larger than the timber bearing.

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 BS6915 and current good practice as described in the latest editions of Lead Sheet Association Publication specified at clause 511, unless specified or agreed otherwise.
- Form roll ends and details by dressing wherever possible.
- 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.

H71.511A LEAD SHEET MANUAL: Purchase and retain on site a copy of the Lead Sheet Association Manual 'Rolled Lead Sheet, The Complete Manual, 2018.

H71.512A HEALTHCARE: Comply with the recommendations given in Lead Sheet Association publication `Working with lead in construction a guide to Healthcare`.

H71.516 INSITU LEAD WELDING: is permitted, subject to completion of a 'Hot Work Permit' form and compliance with its requirements.

H71.517A CONTROL LEADWORK: At locations agreed with the CA undertake initial areas of leadwork as a control of standard for the remaining work. In addition produce samples of leadwelded butted and lapped seams undertaken both in the horizontal and inclined planes. Invite the CA to inspect the work and seek his approval before continuing. Allow to modify the work until a result is achieved to the satisfaction of the CA.

H71.550 LEAD SHEET: Colour marked for thickness and weight and of the type and code specified.
- Milled, to BSEN 12588:1999.

H71.551A CHECKING QUALITY AND THICKNESS:
- Undertake a visual check of all surfaces of all lead to confirm the material is sound, free from inclusions and laminations.

H71.570 EXISTING LEAD TO BE REMOVED: *value* will become the property of the Client.

H71.591A UNDERSIDE LEAD CORROSION AND TREATMENT OF THE UNDERSIDE:
Take precautions to minimise the possibility of underside lead corrosion.
Keep the lead dry.
After bossing the sheet roughly to shape turn it over and remove any deposits from the lead sheet using a nylon scourer to expose a bright and shiny surface.
Prepare a slurry of chalk powder to twice its volume of water. Stir regularly during application. Using a paint brush, apply a uniform coating to the underside of the lead sheet sufficient that the surface of the lead can no longer be seen. Avoid applying chalk to within 50mm of a splashlap. When the chalk is touch dry, a couple of hours, the lead should be laid.
Avoid laying lead when air is moist and condensation is likely to occur on the underside of the sheet.

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 Sub-Contractor of the suitability of bases.
-

H71.611A COATING OF LEADWORK: Where lead is in contact with mortar apply 2no coats of cold bitumen coating solution. Apply sand to the second coat while the coating is still wet.

PROTECTION AND ACCESS TO COMPLETED SLATE ROOF AREAS

H71.700A PROTECTION AND ACCESS TO COMPLETED SLATE ROOF AREAS:
- Access over unprotected slate roof areas is not permitted under any circumstances.
- Where access is required to completed slate areas this is to be done from fabricated roof ladders.
- Purpose made roof ladders are to be constructed from lightweight proprietary aluminium ladders with a continuous 50mm thickness resilient foam backing wrapped up the outside face of ladder strings and secured with plastic ties or other similar arrangement approved by the CA. Replace foam backing as it becomes worn. Ensure that sufficient ladders in combinations of lengths are available to serve the works.

FIXING/JOINTING LEAD

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

H71.715 FIXINGS:
- Where not specified otherwise, fix lead sheet to timber substrates with:
  Copper clout nails to BS1202:Part 2, table 2, with annular ring, helical ring or serrated shank, length not less than 20mm, shank diameter not less than 3.35mm and head diameter not less than 8mm, or,
  Stainless steel (austenitic) clout nails with annular ring, helical ring or serrated shank, length not less than 19mm, shank diameter not less than 2.65mm and head diameter not less than 8mm.
- Where not specified otherwise, fix lead sheet to concrete or masonry substrates with:
  Brass or stainless steel screws to BS1202, table 3, length not less than 19mm and diameter not less than 3.35mm with washers of the same material and plastic plugs of length and diameter to suit screws.

H71.720 CLIPS:
- Generally 50mm 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 0.7mm thick sheet to BS2870, temper grade 1/4H, dipped in solder if exposed to view.
- Stainless steel clips to be cut from 0.1mm sheet to BS1449:Part 2, grade 316, terne coated if exposed to view with edges neatly chamfered 10mm.
- At head of slate roofs provide additional fixing to clip the flashing.
- Unless specified otherwise, fix each clip with two fastenings not more than 50mm from edge of lead sheet. Clips welted around edges of sheets to be turned over 25mm.
- Ensure a movement gap is allowed when folding clips to maintain the facility for thermal movement.

H71.770 WELTED JOINTS:
- Form with a 50mm overlap, 25mm underlap and copper or stainless steel clips as clause 720 at not more than 450mm centres.
- Welt overlap and clips around underlap, loosely turn over and lightly dress down.

H71.790 DRIPS WITHOUT SPLASH LAPS:
- Dress underlap into rebate along top edge of drip and fix with one row of nails at 50mm centres on centre line of rebate.
- Dress overlap over drip to just short of lower level.

H71.820A SCREW FIXING INTO JOINTS/CHASES:
- Ensure that chase in clean and free from debris.

- Dress lead into joint/chase ensuring that the back edge is vertical and tight against the back of the chase. Fix lead with stainless steel washered stainless steel screws and plastic plugs at not more than 300mm centres, at every change of direction and with at least two fixings for each piece of lead.
- Joints sealed as section Z22.

H71.880A FINISHING: As soon as practical, apply a smear coating of patination oil, evenly in one direction and in dry conditions to all exposed faces of lead elements.

Amendments to section H71				
Reference	Clause	Description	Date	By

K20 TIMBER BOARDING/SARKING

To be read with Preliminaries/ General conditions.

K20.220 TIMBER BOARD SARKING FOR LEAD LINED VALLEY GUTTER
- Substrate: Proposed carcassing.
- Boards: 150x25mm Softwood, free from decay, insect attack and wane.
- Surface finish: sawn
- Edges: Square
- Finished face width (exposed width after fixing): 150mm.
- Finished thickness: 25mm.
- Moisture content at time of fixing: Not more than 19%.
- Treatment: Preservative impregnation.
- Standard: To NBS section Z12 and British Wood Preserving and Damp-proofing Association Commodity Specification C8.
- Type/ desired service life: CCA/60.
- Fixing boards: as clause 370, using 100mm x 3.35mm diameter stainless steel ring shank nails, two per board at each location
- Fix with open penny joints.

WORKMANSHIP

K20.310 WORKMANSHIP GENERALLY
- Protection during and after installation: Keep boards dry. Protect from dirt, stain and damage until Completion.
- Boards to be used internally: Do not install until building is watertight.
- Methods of fixing, and fasteners: As section Z20.
- Moisture content of timber supports at time of fixing boards: Not more than 18%.

K20.330 MOISTURE CONTENT OF TIMBER
- Conditions during and after installation: Control ambient temperature and humidity conditions to maintain moisture content at average level specified in BS EN 942, table B.1 for the relevant service condition until Completion.
- Test for moisture content: When instructed, using an approved moisture meter.

K20.350 TREATED TIMBER
- Surfaces exposed by minor cutting and/ or drilling: Treat with two flood coats of a solution recommended by main treatment solution manufacturer.

K20.370 FIXING BOARDS
- Generally: Fix boards securely to each support to give flat, true surfaces free from undulations, lipping, splits and protruding fasteners.
- Wood movement: Position boards and fixings to prevent cupping, springing, excessive opening of joints and other defects.
- Heading joints: Tightly butted, central over supports and at least two board widths apart on any one support.
- Edges: Plane off proud edges.
- Exposed nail heads: Neatly punch below surface.

Amendments to section K20				
Reference	Clause	Description	Date	By

R10 RAINWATER PIPEWORK/GUTTERS

To be read with Preliminaries/General conditions

TYPES OF PIPEWORK AND FITTINGS

R10.131A CAST IRON RAINWATER DOWNPIPES FOR EXTERNAL USE:
- Pipes and fittings: To BS 460:2002
- Manufacturer: Tuscan Foundry Products, Holsworthy, Devon
- Location: All existing downpipe locations (except upper north east elevation of tower)
- Style: Round with ears (Code 6RWPED)
- Accessories: lower pipe shoe eared outlet (Code: RWSED)
- Size:100mm dia
- Finish: fully finished black at the factory:
  Primer coat - Factory applied grey epoxy or alkyd resin single pack anticorrosive primer at 40µ to 80µ dry film thickness.
  Finish coat – Factory applied black high gloss polyurethane two pack top coat at 70µ to 90µ dry film thickness.
  Touch up paint – Black gloss polyurethane single pack paint code XP0007 (250ml)
- Method of jointing: Top-down fixing dry interlink jointed with Black silicone (Code U9BL)
- Method of fixing: to walls with stainless steel 100mm long screws, 25mm dia washers and plastic plugs at 1.830 ctrs. (Fixings to penetrate walls min 50mm)
  Pack out with oak back plates for ears as necessary.

R10.132A CAST IRON RAINWATER HOPPERS FOR EXTERNAL USE:
- Pipes and fittings: To BS 460.
- Manufacturer: Tuscan Foundry Products, Holsworthy, Devon
- Style: Ornamental (Code H1)
- Locations: As existing
- Size: 335x230x240mm (to 100mm outlet)
- Primer: fully finished black at the factory
  Primer coat - Factory applied grey epoxy or alkyd resin single pack anticorrosive primer at 40µ to 80µ dry film thickness.
  Finish coat – Factory applied black high gloss polyurethane two pack top coat at 70µ to 90µ dry film thickness.
  Touch up paint – Black gloss polyurethane single pack paint code XP0007 (250ml)
- Method of fixing: to walls with galvanised 100mm long screws, 25mm dia washers and plastic lugs to both preformed holes in the back of the head. (Fixings to penetrate walls min 50mm)

R10.133A CAST IRON RAINWATER HOPPERS FOR EXTERNAL USE (CORNER):
- Pipes and fittings: To BS 460.
- Manufacturer: Tuscan Foundry Products, Holsworthy, Devon
- Style: Ornamental (Code H1A)
- Locations: As existing
- Size: 240x240x240mm (to 100mm outlet)
- Primer: fully finished black at the factory
  Primer coat - Factory applied grey epoxy or alkyd resin single pack anticorrosive primer at 40µ to 80µ dry film thickness.
  Finish coat – Factory applied black high gloss polyurethane two pack top coat at 70µ to 90µ dry film thickness.
  Touch up paint – Black gloss polyurethane single pack paint code XP0007 (250ml)
- Method of fixing: to walls with galvanised 100mm long screws, 25mm dia washers and plastic lugs to both preformed holes in the back of the head. (Fixings to penetrate walls min 50mm)

R10.143A CAST IRON RAINWATER GUTTERING
- Pipes and fittings: To BS 460.
- Manufacturer: Tuscan Foundry Products, Holsworthy, Devon
- Style: Plain Deep Half Round (6DHR)
- Locations: NE eaves of tower slated roof
- Size: Black 100x75mm
- Primer: fully finished black at the factory
  Primer coat - Factory applied grey epoxy or alkyd resin single pack anticorrosive primer at 40µ to 80µ dry film thickness.
  Finish coat – Factory applied black high gloss polyurethane two pack top coat at 70µ to 90µ dry film thickness.
  Touch up paint – Black gloss polyurethane single pack paint code XP0007 (250ml)
- Method of fixing: to walls with galvanised 100mm long screws, 25mm dia washers and plastic lugs to both preformed holes in the back of the head. (Fixings to penetrate walls min 50mm)
  Accessories:
  Nozzle Outlet (DHRNOZZ) Black painted 125x75mm to 100mm out
  Gutter Stop Ends (DHRSTOP) Black painted 125x75mm external.

INSTALLATION

R10.411A INSTALLATION GENERALLY:
- Install pipes, fittings and accessories in accordance with BS8000:Part 13:Section 3.
- Obtain all components for each type of pipework from the same.
- Form junctions using fittings intended for the purpose.
- Fix pipes at centres not greater than those specified in BS8000:Part 13. Provide additional supports as necessary at junctions and changes in direction. Fix every complete length of rainwater pipe at socket ears.
- Use stainless steel fixings appropriate for the background.

R10.414A PIPE ROUTES: are to be kept as close to those given as possible. Before commencing work agree on site exact routes with the CA.

R10.551A TEST RECORDS:
- Give the CA 24hours written notice of the intention to undertake tests.
- Keep records of all test results and approvals by the CA.

SYSTEM PERFORMANCE

R10.553A COLLECTION AND DISTRIBUTION OF RAINWATER
- General: Complete, and without leakage or noise nuisance.

EXECUTION

R10.600 PREPARATION
- Work to be completed before commencing work specified in this section:
- Below ground drainage. Alternatively, make temporary arrangements for dispersal of rainwater without damage or disfigurement of the building fabric and surroundings.
- Painting of surfaces which will be concealed or inaccessible.

R10.605 INSTALLATION GENERALLY
- Electrolytic corrosion: Avoid contact between dissimilar metals where corrosion may occur.
- Cast iron pipes/gutters: Do not bend.

R10.610 FIXING AND JOINTING GUTTERS
- Joints: Watertight.
- Brackets: Securely fixed.
- Fixings: As manufactures instructions.

- Fixing centres: As manufactures instructions.
- Additional brackets: Where necessary to maintain support and stability, provide at joints in gutters and near angles and outlets.
- Roofing underlay: Dressed into gutter.

R10.635 FIXING PIPEWORK
- Pipework: Fix securely, plumb and/ or true to line.
- Branches and low gradient sections: Fix with uniform and adequate falls to drain efficiently.
- Externally socketed pipes and fittings: Fix with sockets facing upstream.
- Additional supports: Provide as necessary to support junctions and changes in direction.
- Vertical pipes:
- Provide a loadbearing support at least at every storey level.
- Tighten fixings as work proceeds so that every storey is self-supporting.
- Wedge joints in unsealed metal pipes to prevent rattling.

R10.650 JOINTING PIPEWORK AND GUTTERS
- General: Joint with materials and fittings that will make effective and durable connections.
- Jointing differing pipework and gutter systems: Use adaptors intended for the purpose.
- Cut ends of pipes and gutters: Clean and square. Remove burrs and swarf. Chamfer pipe ends before inserting into ring seal sockets.
- Jointing or mating surfaces: Clean and, where necessary, lubricate immediately before assembly.
- Junctions: Form with fittings intended for the purpose.
- Jointing material: Strike off flush. Do not allow it to project into bore of pipes and fittings.

R10.675 CUTTING COATED PIPEWORK AND GUTTERS
- Cutting: Recoat bare metal.

COMPLETION

R10.910 TEST
- Preparation: Temporarily block all outlets.
- Testing: Fill to overflow level and after 15 minutes closely inspect for leakage.

Amendments to section R10				
Reference	Clause	Description	Date	By

Z21 MORTARS

To be read with Preliminaries and General Conditions

Z21.111A REFERENCE SECTION: this section specifies mortar common to a number of work sections.

CONSTITUENT MATERIALS

Z21.112A SAND FOR MORTAR: to BS1200 or as agreed with the CA following analysis and control trials for low clay/silt content:
Supplier: Cornish Lime Company, Old Callywith Road, Bodmin. Cornwall. PL31 2DZ

Z21.114A HYDRAULIC LIME: St Astier NHL 3.5 or equivalent approved by the CA.
Supplier: Cornish Lime Company, Old Callywith Road, Bodmin. Cornwall. PL31 2DZ

Z21.115A WATER: to be clean and uncontaminated. Where required by the CA, submit samples for testing to an approved test house.

SITE MIXED MORTAR

Z21.121A MIX MORTAR: on site to the agreed proportions and to the workmanship requirements of this section.

Z21.122A LIME BASED PRODUCTS: Mix all lime based mortars at ground level to reduce the danger of burns in the event of spillage.

MORTAR MIXES

Z21.131A MIXES FOR STONEWORK: ***(indicative only for tendering purposes).***

Hardwick Stone Pointing Mix:
1 part Hydraulic lime (NHL 3.5)
3parts Well graded course CLS 28 sand (1-2mm to 0.075mm up to 10mm joint; 3-5mm to 0.075mm up to 20mm joint;)

Shelter coat mix (Plastic repair)
St Astier St One Stone Repair (Lithomix) colour matched to Hurdwick stone with Hurdwick dust/aggregate in strictly accordance with manufacturers details/CA site approval.

Granite Pointing Mix:
1 part Hydraulic lime (NHL3.5)
3 parts CLS 28 sharp sand (1-2mm to 0.075mm up to 10mm joint; 3-5mm to 0.075mm up to 20mm joint;)
1/6th part Coal dust

Note: All final mixes to be agreed with the CA after analysis of existing and site sample pallets have been pre agreed as clauses C45:113a and 162a

Z21.140A SHELF LIFE: Ensure that hydraulic lime is stored in sealed containers, marked with the date of manufacture. Use within 4 weeks of manufacture.

Z21.350A SITE STORAGE OF MATERIALS:
Store different sands and aggregates clearly labelled tubs protected from frost.

Z21.360A MAKING MORTAR:
- Mix/decant all lime based mortars at ground level to reduce the danger of burns in the event of spillage.

- Use operatives who are skilled and experienced in making and use of lime-based mortars. Provide evidence of their experience.
- Keep plant and banker boards clean at all times. Avoid contamination by other materials.
- Measure materials accurately by volume using clean gauge boxes or clean undamaged buckets.
- Do not mix mortar when the air temperature is at low or below 5^{o}C and falling or below 3^{o}C and rising.
- Hydraulic lime should be mixed for approximately 8 minutes in a drum mixer, emptied into a large tub/bath and whisked with a proprietary drill attachment for 2-3 minutes. Mix with aggregate and minimal water to create a workable mix. Samples of the aggregate are to be checked by the hydraulic lime supplier for suitability prior to commencement of the work. Inform the CA of the results. Mechanical batch mixers may be used only after submission of a method statement. In preference, edge running mortar mills such as Rolpunit or similar may be used. Mortar is to be turned out into clean boards and pounded after mixing. The mortar mill must not run for longer than specified.
  Hydraulic lime will not set at temperature of below 5^{o}C and the water temperature must also be taken into account. If the temperature falls below 2^{o}C hydraulic action will cease. If this is a possibility protective measures should be proved as specified at sections C45 and C46.

Z21.400A SAMPLE AREAS:
Undertake min 4 samples 300mm² at pointing using indicative pointing trial mix given in Z21.131A. Adjust to approval of CA allowing further 4 x 300mm² samples to ensure correct mix.

Amendments to section Z21				
Reference	Clause	Description	Date	By

Z22 SEALANTS

To be read with Preliminaries and General Conditions

Z22.110A SEALANT TYPE 1
- Location: Flashing tuck-in chases where instructed by CA over NHL pointing.
Manufacturer: Dow Corning Hansil Ltd.
Sealing Material: 797 low modulus silicone sealant.
Colour: stone.

Z22.112A APPROVED APPLICATORS: Sealant joints are to be undertaken by applicators approved by the sealant manufacturer.

Z22.120A SUITABILITY OF JOINTS: Before commencing, check that:
- Rebated joint dimensions are as detailed and within limits specified for the sealant.
- Surfaces are smooth and undamaged
- Preparatory work that must be done before assembly of the joint has been carried out.
- Inform the CA if joints are not suitable to receive sealant and submit proposals for rectification.

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

Z22.160A APPLYING SEALANTS:
- Ensure that operatives observe manufacturers 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 neat, slightly concave profile unless specified otherwise.
- Protect until cured.
- Remove masking tape immediately after tooling.

Amendments to section Z22				
Reference	Clause	Description	Date	By